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Jane Emilia Lloyd
from 14

INSTRUCTIVE PICTURE BOOK.

THE

OR

LESSONS FROM THE VEGETABLE WORLD.

BY

THE AUTHOR OF "THE HEIR OF REDCLYFFE" AND "THE HERB OF THE FIELD."

ILLUSTRATED WITH 31 COLOURED PLATES. ARRANGED BY ROBERT M. STARK,

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C. M. Yonge

"It is a fallacy to regard memory as a vessel which receives and retains impartially what may happen to be poured into it: it is only what has awakened a child's interest that it remembers tenaciously, and recollects quickly; and only those impressions awaken a child's interest which are adapted to the stage and condition of its mind, which gratify, and excite while they gratify, its appetite for knowledge. Now, can it be doubted that it is external objects which most attract and fix the attention of children, and which are consequently most naturally, easily, and permanently remembered! This vast field, partitioned as it has been among very many sciences, for which collectively we want an adequate title, and of which we would now mention only one, though a very comprehensive division — Natural History — affords most ample materials through the longest school course, for developing as well as storing the youthful understanding, and for arousing the young wonder and sense of beauty." — *Dr. W. B. Hodgson, in Westminster Review, October 1853.*

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VEGETABLE SUBSTANCES.

Before the Earth was peopled with the Animals you have learnt in your first picture book, it was made pleasant for them by the growth of herbs and trees, to afford them food and shelter. These green things, plant, shrub, and forest tree, from the Vegetable Kingdom, and this book is to make you better acquainted with some of our best and most useful friends.

All Vegetables are formed of an immense number of cells and vessels, divided by a thin transparent membrane, and filled with juices of various colours, which, seen, through the coating, give the tints of the different parts of the plant. Although each cell is so small that they cannot be seen with the naked eye, the microscope shews that they are generally either round or oval, or six-sided, like cells in a honeycomb; while the vessels are long cylinders, and more like pipes or tubes. They have little openings from one to another, and spaces between to serve for passages for the sap and other juices.

The sap is, as it were, vegetable's blood; for it is their spring of life and growth, and when it is not moving, they are either dead or in a sort of sleep, neither growing nor bearing fruit. And just as animal blood is fed by food, and kept in motion by the air that is breathed in; so the sap is fed by moisture from the ground, and rendered healthy by nourishment from the air.

The Roots, which fix the plant in its place, contain their mouths. Each of the little fibres or branches of the root ends in open cells, like a sponge, by which moisture is drawn up from the ground, to circulate through the vessels in the stem and branches, and push on the buds and blossoms.

If the roots are mouths, the leaves answer to lungs, for their cells draw in the air, and give out again that portion of it which is not needed for the support of the plant; and they are covered with small holes for this purpose.

New plants are chiefly produced from seeds, and the blossoming and fruit-bearing are the great summer business of the Vegetable world, and are called the Fructification. Microscopes have shewn us that the seeds bear packed within them the tiny embryo of the future herb, shrub or even tree, that is waiting to spring forth until it shall be placed in the right soil, with as much warmth, moisture and light as its own nature may require.

PLATE I.

Vegetables have been divided into several great classes and the first plate gives examples of each of these.

I. CRYPTOGAMOUS & II. PHENOGAMOUS-PLANTS.

Flowerless.

Flowering.

CRYPTOGAMOUS plants are those in which the process of fructification is invisible to us.

PHENOGAMOUS plants are those in which fructification or blossoming and seeding is visible.

I. CRYPTOGAMOUS-PLANTS.

The flowerless races are in tribes very unlike both to each other or to the flowering plants, so that they are quite a study apart, and perhaps the most mysterious and difficult part of botany.

LICHENS form the yellow, white or grey crust that paints old bricks, or stones, or they hang like hoary hair from the branches of trees, peep out like scallops of brown leather from among the short grass on downs, or moors, or sit like lumps of yellow jelly upon the old limbs of

trees, or like those in the plate (fig. a) rise out of rotten wood. They seem at first sight to have no parts at all, but on examination even of the grey crust on the wall, it may be found that one edge is slightly raised. Beneath this, microscopes discover an infinite number of minute purses, each filled with seeds too small to be seen or even to be felt, but yet with life and growth within them. The air is full of these invisible seeds, they fix themselves wherever they can find a resting place, and the lichens spring forth. They can live where everything else would starve, heat and cold do not hurt them, and it is almost impossible to keep them away. To us they seem the first tokens of age or decay, but Infinite Wisdom has made them also the first beginnings of vegetable life. Their growth upon the bare rock or dry wood, forms mould enough for the maintenance of other plants, a little larger, these again for others, till the whole dreary stony mass, or old decaying tree becomes the seat of beautiful and refreshing verdure and shelter. And thus the yellow lung-wort on the ruin, and the hoary liver-wort on the hollow oak shew us that we must not despise the day of small things.

The FUNGUS TRIBE are near relations to the lichens, but are usually larger. Their purses of invisible seeds are within a fleshy covering, instead of being exposed to the air like those of the Lichen. The handsomest and most developed of the race are the AGARICS, to which belongs the fungus in the plate (fig. b). Many of them are poisonous and their principle office seems to be, like that of the lichen, to form soil by their decay, as the fore-runners of a higher class of plants.

ALGAE or SEA-WEEDS are the vegetation which clothes the depths of the Sea, and serves for the support and shelter of the creatures which inhabit the ocean. They are of all sizes, from one which can hardly be seen, and grows upon the gills of fish, up to enormous streamers longer than the mightiest forest tree; but their seeds are in visible, and the parts by which they produce them are very different in various kinds. Sea weeds are generally brown, if they grow in shallow water, green where it is a little deeper, and pink, like the beautiful DELESSERIA in the plate, (fig. e) when they grow far down in the sea, without much light. The fructification of this pretty genus is carried on in the winter, upon the rib down the middle of the leaf, or frond. One of these beautiful pink leaves has been found thirteen inches long and eight broad. They are some times washed up on the Sea shore, with a few other pink kinds, but the brown sorts are more often met with. All children who have been by the sea-side will remember the Sea gooseberries, or Bladder weed, with the large lumps on them, which crackle and pop when they are put into the fire. These are not fruit, but are bladders of air to keep the plant floating on the water. The Lion's Tail or Sea Tangle is likewise a great favourite; it has a solid stem ending in a great number of broad streamers which bear little clouds of purses full of seeds. How happy little children are sweeping the sands with the long brown streamers, the hard stalk fast clasped in their hands; and others may delight in pulling out the long round twisted Sea Laces, which grow to such an enormous length that boats some times get entangled in them; or the Sea Thongs which are flat instead of round, and grow from little green buttons upon the rocks. Sea weeds are chiefly useful when burnt; the ashes are called KELP and are used in the making of soap and of glass.

MOSESSES have leaves and stems and bear their seed purses in a delicate little urn or helmet which shoots up at the top

of a slender brown or red stem. The urn is drawn magnified, by the side of the little moss plant (fig. d), that its curious shape may be seen. When the seed is ripe; the top rises up, and falls off, leaving the case open as here shewn, so as to let the purses out but they are still guarded by the little fringe of teeth in which ends the rim of their cup and which are so wondrously and beautifully made that they close up on the least touch of damp that might hurt the treasured seed within. Moss grows in clusters and cushions of the richest brightest green. Each tuft of velvet moss is in reality a fair forest of tiny trees, each perfect, with the green leaves below the brown stem bearing the graceful urn. Even the small round dot on the tiles of a house is a whole wood in itself, and there must be millions of moss plants in the handfuls that are torn up to dress out a bowl of flowers. What would our woods be without their banks of elastic dry fresh moss, of that delicate soft green sort (the **PROLIFEROUS HYPNUM**) which has the graceful leaves so curving and so soft. How dreary our decayed trees would be were they not clothed by the **HYPNUM** of the plate; how much bright green moors and bogs would lose without the creeping Hypnum, always shewing a dangerous place; and the dark, tall, dank swan's neck **BRYUM**.

It was the examination of a little piece of moss, so freshly green, and so beautifully formed, that cheered the heart of the great traveller Mungo Park, when he was ready to sink down with hunger, thirst and fatigue in the African desert, for the wondrous perfection of that tiny plant brought to his mind the presence and the care of the Great Creator, Whose Hand is over all His works.

FERNS are plants which at first sight seem to be all leaf and no blossom. They love the hedge side, and the shelter of the rock, or woody bank where they may freely raise their delicate wavy foliage. They have a stiff strong footstalk, whence spreads the leafy part called by the learned the **FROND**, which usually bears the seed bearing portions. In the **POLYPODY** (fig. e) you may see, on the back of the leaves, some small dots; these are clusters of cases, in which lie the purses, filled with minute seeds. The purses, not to say the seeds, are so small that the eye cannot discover them, and so it used to be an old saying that those who gathered fern seed could walk invisible, meaning that the one was as impossible as the other. The polypody has these clusters in round dots, like little spots of gold on the back of the prettily divided fronds, ranged with perfect regularity. It may be found all over the British Islands, growing on old trees, ruins, banks or rocks and keeping its fresh bright green all the winter. The beautiful feathery **MALE FERN** and delicate **LADY FERN** have their dots much darker and far smaller. The long undivided fronds of the polished **HARTSTONGUE** have little brown lines, alternately long and short, on the back. The **BRACKEN** or **EAGLE FERN** has the latter name, because when the stem is cut through, there is a black mark, which some call a Spread Eagle, while others say it is King Charles in the Oak. It is the cover which most abounds in parks, as a shelter for deer, and which turning brown in autumn, gives the rich tinting to woods and moorlands; the fructification is carried on, not in dots; but under the edge of the frond which is turned over all the way round like a hem. Bracken has a great deal of potash in it, and is burnt in great quantities for the sake of the ashes which are used in making soap; it is also used for litter for pigs, and is the most profitable of British Ferns. But in other countries, Ferns are far more important. In New-Zealand, they are eaten by the natives, and in hot climates, they grow to the size of trees. Indeed it is plain that fern trees must once have grown in Great Britain, for the shape of many of their large leaves is to be found upon pieces of coal and this useful mineral is believed to be masses of moss, ferns, trees and other plants compressed closely together under some great heat. These plants with their unseen blossoms have had a strange share, in old times, in the formation of our world.

II. PHCENOGAMOUS-PLANTS or FLOWERING-PLANTS.

All these are so formed as to follow certain rules in producing their blossom and seed, and no one can look into a flower

without being the more surprised and delighted, the more he examines, and also, it may be hoped, thankful that so much has been done to delight our eyes and our other senses by the beauty and sweetness of these blossoms.

First there is what children call the

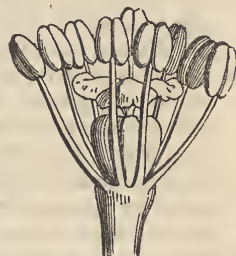
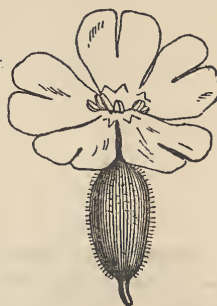
FLOWER, the blue, pink, or white leaves. The proper name of this is the **COROLLA**, and each separate leaf of it is called a **PE-TAL**. In the **ROSE** (fig. i) the corolla is in five separate petals, in the **Auricula** (fig. k) it is in one single petal such as you could pull out all at once. This corolla is fastened, to keep it safe, into a green cup, called the **CALYX**, or chalice, which closed over it in the bud, and shut it in safely from harm till it was time for it to unfold. This calyx is the outer curtain, the corolla is the more beautiful smooth inner curtain of the dwelling place within the flower. The calyx is often rough or covered with spines, or perhaps with hairs or with down, to keep all safe and warm; the corolla is smooth, satiny, and often beautifully coloured. And what are the parts so choicely sheltered? See within, a number of long slender threads each bearing a yellow case on the summit. These threads are named **STAMENS**, the thready part is the filament the case which they bear is the **ANTHER**. When ripe it is full of fine yellow dust named **POLLEN**, the same which is gathered by the Bees to make bee-bread, but which has another use in the flower. In the middle of the stamens is a green or brown cushion sometimes ending in a knob, like a pin's head, sometimes in a crown of points, sometimes in little hooks. This is the **CAR-PEL** or **PISTIL** which is to become the case for the seed. The top, whether pin's head or crown, is named the **STIGMA**, the slender thread the **STYLE**, the cushion below, the **GERM**. The office of the anthers is to scatter their yellow dust on the stigma; whence it passes down the style, and this done, the corolla gradually fades away, while the germ enlarges, and in time becomes the fruit. In the wild rose (fig. i) the germ has swelled into the red fruit beside it, which has five divisions, one for every division of the carpel. In other plants, the carpel becomes a pod or a capsule, or a purse or a berry. There are infinite varieties of fruits as there are of forms of corolla and numbers of stamens, but the great rule is, that no seed is produced without stamens and pistils. Sometimes they grow in separate flowers as in the **OAK** (fig. m) sometimes even in separate trees sometimes there is no corolla, sometimes no calyx, but stamens and carpels there must be. The only flowers without them are those which are called double, and these have their petals so multiplied as to leave no room for the useful parts, and therefore they can never produce any fruit.

These **FLOWERING-PLANTS** are again divided into two great classes

I. ENDOGENS & II. EXOGENS.

(Inward Growers.) (Outward Growers.)

Endogens or inward growers shoot up from the Earth with a single bud, of the full girth of the future stem. The outer part of the stem is the hardest; it is often hollow within





seldom branched, and the outside is smooth. The leaves are long and narrow with veins running their whole length and springing either from the root, or from joints in the stem. The flowers have their stamens and petals always in some number that can be divided by three. So unvarying is this law that a botanist, by merely looking at a flower, could tell at once whether it belonged to an inward or an outward grower. Three Endogens are given in the Plate. GRASS (*f*). PALM (*g*). ORCHIS (*h*). Of GRASS more will be said by and by. The PALM belongs to other countries, where in the East, the Date Palm feeds the Arab of the Desert, and in the West, the Cocoa nut supplies both food and drink to the Southsea Islander. The palm leaf which does not fade, and lives as long as the tree, has always been the token of victory and an emblem of the Everlasting joy prepared in Heaven for those who have won the battle with sin in this world.

The ORCHIS is a pretty spring plant which may be found in woods and meadows. The star of shining green leaves spotted with black is one of the first tokens of summer, and from within, shoots up the soft stem and purple spike of the handsome spotted Orchis. That in the picture is the Meadow orchis, which grows in company with cowslips all over our pastures and may be known by the brown stripes on the wings, and there is also the sweet white Butterfly or Honeysuckle Orchis, so fragrant and so delicate. Orchises have one stamen and the rudiments of two others, growing into the pistil, but their construction is far too puzzling for a young botanist, and we will pass on, only just pausing to note that the Orchis tribe is the most curious of all in form. Our own are dröll enough. The six petals manage to assume many odd shapes, the spur behind, the helmet above, and the wings-at the sides and the broad spotted lip, and some families seem formed in imitation of insects. We have the Bee Orchis whose velvet lip is turned over and mottled with brown and yellow like the tail of a Bee, and the rarer Fly Orchis which looks like a blue-eyed fly, cut out of puce coloured velvet; and the Man Twayblade, like a little green man hanging. But in hot climates the Orchis tribe are beyond measure strange and beautiful. Frogs, lizards, butterflies, nay even the white dove brooding on her nest, are to be found among their fantastic shapes, and are some of the most wondrous tokens of the infinite variety of Creation, so wild yet always obeying a certain law of regularity.

II. EXOGENS or OUTWARD GROWERS.



Exogens spring up with two seed leaves or cotyledons on a single stem. This stem gradually enlarges by adding layers to the outside, in circles one beyond the other, the hardest the innermost, surrounding a central pith which communicates with the outer ones and the bark, by little rays called the MEDULLARY rays (the best way to see how this is, would be to look at the stump of a newly cut down tree, when the rings one within the other may plainly be observed). The stem or trunk is generally branched and the

bark is cracked and furrowed when old to make room for the increasing size of the tree. The leaves spring from footstalks and have one main rib down the middle, branching off into other veins, and these joined together by lesser ones, so as to make a network throughout so beautiful and intricate that nothing can give any notion of it but looking at a skeleton leaf. The whole of this net is covered by a membrane filled with cells containing green colouring-matter and which is called the PARENCHYMA.

The divisions of the corolla, and the stamens may be counted either by twos, by fours, or by fives, the rule of five being

by far the most constant; and the seeds are always divided into two, that they may give birth to the two seed leaves. The way in which a bean or a walnut is sure to break in half is an instance of this. All our timber trees are exogens and so are almost all our principal plants. The examples in the plate are the Rose (*i*). The Auricle (*k*). The Clematis (*l*). The Oak (*m*). In all these, different as they are, you may trace the veined leaf, and the corolla divided by five. The Oak branch is drawn with the acorn instead of the blossom, which like that of the hazelnut has its stamens and pistils in different flowers; the carpel blossoms being small, sitting on the bough and almost hidden. The stamen bearing flowers hang one over the other with scales between, forming long soft tassels or calkins called by country children pussycats. It is believed that the wind or the bees carry the pollen from them to the germs: But of all these wonders we shall have to speak more particularly at their own pictures.

PLATE II. SPRING-FLOWERS.

No sooner has the soft south wind begun to breathe warmly upon the hard frosty ground, than the vegetable world begins to wake from the winter sleep, and patiently and silently do the buds peep out from the earth; ready to wait quietly if another cold wind should sweep over them, or to sleep gently beneath a fresh coat of snow, but pressing bravely and cheerfully on at the first shower, and smiling in the beams of the wintry sun. The earliest and hardest of these have a curious provision, a sort of under ground bud, which is called a bulb. Look at it in the CROCUS (*h*) and the SNOW DROP (*c*). The true roots are below, fibres like other roots, but the bulb was formed in the summer of the previous year, and consists of coat within coat, all covering and nursing the young plant folded closely up within them. This bulb contains a store of nourishment, drawn from the ground, and laid up within it, so it has no need to ask the dry wintry soil for any maintenance for the plant, but only to push it on into the upper air, and this is the reason that hyacinths will blossom in glasses, without any earth, but with only a little water to support their fibres. All bulbs are endogens, and have long leaves growing straight from the root. In the SNOWDROP (*c*) the first thing seen is the white blossom bud, rising between the green leaves. a most welcome sight. It is held upright by the calyx, a green sheath, which by and by splits, and standing upright, lets the white drop hang down on the delicate stem. The petals are six; three, white, egg shaped, and large, enclosing three smaller, cleft in the middle, and each marked with a spot of green. In the midst are six stamens, and a single carpel, the germ of which is outside the corolla. The pure and modest white and green of the snowdrop make it more loved and prized as the first child of spring, than many more beautiful flowers. It fears no cold, and is to be found in the shade in almost every garden, and in some few fortunate places it is wild. The GOLDEN CROCUS (*h*), as brave and merry as the snowdrop is pensive and retiring, basks in the first rays of sunshine, and loses no time in meeting them, for it has not even a stem to put up, and the long slender leaves with a white midrib do not come forth till late in the year. There is a sheathlike calyx, like thin paper at first, but the swelling bud soon splits it, and on every fine day, widely do the six petals unfold to let in the sunshine to the three stamens, and the carpel so beautifully crowned with a saffron stigma. Bright vases are the crocuses, whether, purple, yellow or white, and dearly do the bees love to go deep into them, for the first taste of new spring honey of the year; but they only open for the bright hours of the day. As soon as the sun goes off, or is hidden by a cloud, the corolla closes up over the treasure within, and opens no more till called by the next sunbeam. One purple crocus is wild in England, but the handsome yellow one comes from Turkey.

Though full of honey, Crocuses have not the honeycup or nectary which may be seen in the two NARCISSUSES (*a*) and (*b*). They belong to a beautiful genus of bulbous rooted flowers, named from a youth in an old Greek fable, who fell in love with his own image reflected in

the stream and pined to death; when he was changed to this flower with the drooping head in remembrance of his bending over the stream. The narcissus has six tall stamens around a long slender Carpel, all within the nectary or honey cup, which in the Poetic-narcissus is yellow tipped with red. The contrast with the six white petals has the country name of the flower to be Butter and Eggs, caused where it grows wild in hedgerow banks, but it is chiefly a garden flower. It is strange that it should be called the Poetic narcissus, when far more verses have been written about its bright brother the DAFFODIL; whose pale petals are a beautiful contrast to the rich gold of the fringed nectary. The texture of this nectary is so peculiar that it seems covered with sparkles of light, and the two yellows blend together as only the colouring of nature can accord. One great charm of these flowers is the multitude in which they fill the copses. Truly they are well described as "continuous as the Stars that shine and twinkle in the milky way", shining out on the banks among the early budding green wood, and nodding their graceful heads in the spring breeze. Gather and gather as happy children may, they cannot carry off all the daffodils; but many have carried away the recollection of the merry day, fresh with early spring, and at the thought,

"My heart with pleasure thrills
And dances with the daffodils".

Side by side with them grow the PRIMROSE (e) and her meadow brother the COWSLIP (f). The name of both is Primula, meaning the first, for the primrose's pale blossom often unfolds on the sunny hedgerow as early as the snowdrop: though the stems are then very short, and the leaves very small. The Primula belongs to a numerous race of exogens, all with corollas with a single petal, with a deep throat or tube, spreading into five regular divisions, and almost concealing five stamens and a pin headed carpel. The distinction of the primrose is that the blossom is large, and the flower stalk rises straight from the ground, unbranched. The stem and the midrib of the leaf, are of a pale pink tint and downy, as is also the deep-five cleft calyx. The flower is of the exquisite light hue that can only be called primrose colour, but which loses its delicacy as soon as it is transplanted into a garden, and there is a little pentagon of rich deep yellow round the summit of the throat. To see a primrose rightly, you should visit a sunny bank near the end of April, and look beneath some mossy stump, at the profusion of fair meek pale starry blossoms, among their spreading leaves, with endless buds growing up to succeed them, and their looks seeming to smile modestly in the sunshine. The Cowslip comes a little later, in meadows, where it grows profusely in most counties of England, though not in all. The flowers grow in clusters of bells, all parting together from the top of the straight stalk, the calyx is deeper than that of the primrose, the tube of the corolla longer, the star smaller. The colour is a deep bright soft velvet yellow, with five bright red spots, "fairy favours", around the opening of the tube; but the colours so gentle, though so bright, that there is no glare no gaudiness. The scent is most delicious, with all the rich pure fragrance of a cow's breath; which must be the cause of the name, redolent of all the sweet thoughts of spring and

"Sunny meadows wide
Gemmed with cowslips in their pride".

Cowslip gathering is one of the prettiest and most delightful of the pleasures of spring, and all children who have ever made a cowslip ball will agree that there is no plaything ever bought in a shop to compare with that fresh, soft, sweet-smelling cluster of beautiful flowers. Old fashioned housewives often make cowslip wine, and children sometimes enjoy the brewing of cowslip tea. In the midland counties, these flowers are called "paigles". They are the parents of all the rich dark handsome polyanthus race, which are grown in gardens.

Dear to lovers of spring are likewise

"Violets shy
Betraying where they lowly lie
By the soft airs they breathe".

They are the favourite emblems of lowliness, shrinking out of sight and yet loved by all who trace them out and prized most highly for their delicious perfume. They follow the great rule of five, with five stamens devoid of fila-

ments, but the orange anthers closely united together round the pistil, forming the little bright eye of the flower, in the midst of the five petals, the two uppermost of which stand upright, the two next spread on either side, and the lowest hangs down in front like a lip, with a curious little horn or spur behind. Each petal has near the centre, a crest of delicate little white hairs, which add much to the grace of the flower. They are the longest and handsomest in the DOG-VIOLET (d), the grey or lilac blossom streaked with black, which grows in profusion in coppices, in beautiful contrast with the primrose and does not deserve to be despised as it generally is, for its want of scent. Yet the sweet violet, blue, white or red, well merits the delight with which country children go "violetting" along shady lanes, or in corners of fields, charmed with each bud they can turn out from among their nest of heart shaped leaves; and the fragrance is such as to increase after the flower is gathered, so that a violet is often more sweet in the late evening, than when first gathered. It may thus put us in mind of the memory of a kind deed, or gentle word, perhaps not so much thought of at the time, as prized afterwards in recollection.

The WOOD ANEMONE or Wind flower (g) spreads her frail delicate white stars over the copses in the haunts of the primrose. The stalk, like that of the other early spring flowers, is simple, with two leaves springing from it, like wings, spreading and dividing into five leaflets, which form a pretty setting for the white blossom, just touched enough with pink to give it a pearly hue, and often in later spring becoming quite a deep pink. There is no calyx, the petals are five, and the stamens and carpels too many to be counted. When ripe, the styles of the carpels become little cottony wings, on which the seed is borne away by the winds to the ground where it may take root. This delicate woodland blossom is the English species of a numerous race. The pink and blue HEPA-TICA, which adorns cottage gardens here, but grows wild all over the islands of the Baltic Sea, and pierces through Swedish snows, is another species; and the grand scarlet or purple poppy anemone prized by gardeners was brought from the East. There it grows in profusion on the hills of Judea, concealed by longer grass, which when waved aside by the wind, discloses for a moment the blossoms beneath, like a river of crimson seen in flashes.

PLATE III. SUMMER-FLOWERS.

Summer brings such a host of delightful blossoms that it is hard to choose between them. The vegetable world is in the full flush of beauty, each plant fed by the dew, and led on by the sunbeams to put forth all their glory, and finish their task before autumn shall bring death to the annual, or sleep to the perennial. Two nosegays are here set before you, gathered from the choicest gardenbeds, the very queens and princesses of the world of flowers.

To begin with the WHITE LILY (b). Look at her portrait, and you will see six petals, and six stamens, whence you may perceive that she is an Endogen, and has a bulbous root, but it is not one in coats, like that of the crocus, but in scales one above the other, not very unlike the small straight veined leaves which grow at regular distances up the stalk, and of which snails are far too fond. There is no Calyx, for the corolla is of such solid thickness as to need no protection. The style rises from a green germ and bears a triple ornament on the summit, and most beautiful is the aspect of the six graceful filaments bearing their large caskets of pollen. The size of the anther makes the form more evident than usual, and you may see the double case, which when ripe, parts asunder and discharges the pollen on the style. The whiteness of the Lily, the beautiful shape of the flower, the graceful arrangement of the grand looking blossoms on the wandlike stalk, have made it one of the most admired and prized of all the flowers grown for beauty. It was brought to European gardens from Palestine, where it grows wild on the hill sides and many believe it to be the very Lily of the field of which it was said that 'Solomon in all his glory was not arrayed like one of these.'

The ROSE (a) is by all acknowledged as queen of flowers, but to see her before her royalty begins you should

turn back to plate I. (fig. i) where she is shown in her wild simplicity, such as you may find the blossom of the delicious sweet briar, or on the long trailing wreaths of dog rose in the hedge, or the gay little yellow-eyed, dark-stemmed Scottish briar-rose. The sorts of roses are innumerable, nearly forty grow wild in England, many more in Europe and Asia, and gardeners have produced countless varieties by cultivation, but in many respects they are all alike. All have a hard woody stem covered with thorns, and generally trailing or climbing leaves composed of five leaflets, two in pairs and one at the end, jagged round the edge like the teeth of a saw. They also have a hard round germ beneath the flower, crowned by a calyx in five divisions, supporting a corolla of five petals, loosely fixed, and not fastened to the numerous yellow stamens in the centre, which as well as the cluster of styles grow from the carpel. When the blossom falls off, the calyx remains crowning the germ, which swells and becomes a scarlet or purple fruit, with five divisions, filled with yellow seeds, the hips of our hedges. The Roses of cold climates have the germ guarded with hairs or bristles, those of warm countries have it naked. From the earliest times, the peculiarly fresh perfume of the Rose has caused it to be treasured in gardens, and cultivation has multiplied the petals, and varied the tints of the species so as to produce the numerous beauties to be seen in every garden. The old fashioned CABBAGE ROSE yields to none in fragrance, and the MOSSROSE is perhaps the most beautiful of all, the dark CHINA ROSE clusters over the cottage walls, the pale NOISETTE climbs over the trellis, the ROSE UNIQUE looks like a ball of snow, and puts us in mind of its inventor, good king René of Anjou, the father of our Queen Margaret, the heroine of the red rose, while the YORK and LANCASTER with both tints is a remembrance of the union of the two parties in the house of Tudor.

"Let merry England proudly rear
Her blended Roses bought so dear".

Roses used to be worn round the head at feasts, and the guests used to wash their hands in rose water, distilled from the petals of Roses. In the east, princes delight to lie upon a couch or stack of fresh rose petals, chiefly of the damask rose, or rose of Damascus, and the mother in law of the Great Mogul actually filled a canal with rose water on which she sailed in her boat. The heat of the sun disengaged the oil from the rose water, and thus was discovered that very strong scent, attar of roses, which is manufactured in Turkey and Syria. Much more might be said of this loveliest of all flowers, but we must pass on to the CARNATION (c). This is one of the Pink or Dianthus tribe, pretty flowers, with long linear sea green leaves, pointed stems, and a deep calyx with five points containing five petals, each with a long slender limb to fix it into the calyx, and a spreading blade, cut and ornamented at the edge, and generally either red, white or variegated. The stamens are twice five, the pistils two, each with a beautiful long curled stigma, sometimes blue or black, looking like the trunk or horn of an insect. These may be found in the few little delicate native pinks, in the strange wild looking 'ragged robin', or in beautifully variegated Indian pinks of our gardens, with their infinite varieties of red, black and white patterns, or again in the clustered Sweet William, but in the pinks, picottees, cloves and carnations of the florist, the petals are so numerous as to destroy the stamens and pistils and crowd the calyx even to bursting unless it is supported with a card board frill. The Pink has jagged edges, the Carnation has them plainly rounded and the Clove is of one dark crimson colour, with a peculiar and delicious smell. Frailest and most delicate of summer flowers, the CONVULVULUS (d) twines its weak trailing stem, and heartshaped leaves wherever it can find support, and thus has won the English name of 'Bind-weed'. It has a single style, five stamens, and a corolla of one petal, shaped like a half opened parasol and divided into five. It is a very wide spread race, and comes to the greatest perfection, in tropical climates whence many sorts have been brought to ornament our gardens. The most common are called, though not correctly, the *Convolvulus Major* and *Minor*, and come, the first from Africa, the second from Spain. The *Major convolvulus* is

that in the picture, and shows most beautiful varieties sometimes white with purple lines, sometimes purple rayed with red, pink with crimson or with white, but it is too delicate to bear the strength of the sunshine and withers before noonday. The lesser convolvulus is blue, with a white eye and yellow ray. It is hardier, though it dies as soon as gathered. The most lovely of all is the wild white bind-weed, buds and blossoms of the most graceful form, snowy white, and growing in long wreaths, but tainted by a breath, and fading at a touch. The small English bind-weed is rose coloured and white, varying in depth of tint according as it grows in sun or shade, an exquisite little flower, but treated as an enemy, for making gravel walks untidy, and for growing up among the corn, and tying it down, if it have been laid by a thunderstorm.

Favourite of poetry, here stands the PANSY (e) a plant of many names. Its proper Latin name means the three coloured violet, and a violet it is, with the same five united Stamens, the same petals and spur. "The little western flower" is to be often found "milk white" in clover fields, very small and tenderly coloured, but a little richer soil soon renders the upper petals purple, the lower yellow, and expands the black streakings in the eye till the peculiar sunny smile of the flower has won it the pretty names of HEARTSEASE and LOVE IN IDLENESS; and in French it was called PENSÉE or thought, perhaps because the varieties are as strange as are thoughts. A larger handsomer sort from the Altai mountains, mixed with our own, has made the garden sorts infinitely magnificent and various, from one intense glow of the richest dark purple velvet, down through every variety of purple, yellow and white, sometimes emulating a cat's whiskered face, sometimes an old Man with purple brows and beard, down to yellow trimmed with blue, or even white with a little dark eye; but ever with the same joyous expression painted on the countenance.

The HONEYSUCKLE or WOODBINE (f) is as dear to our country walks as to our gardens. The stem is woody, though climbing and very long lived, so that it clings for many a long year round the same tree, and even twists itself in till the bark grows over it, and the two are fastened together in perpetual union. The leaves are in pairs, and the little twin leaves are some of the first tokens of spring bursting out on the hedge side when their down has to support tears of hoar frost almost every night. The flower does not come till nearly the end of the summer. It grows in clusters, parting from one common calyx whence arise eight or nine long slightly curved buds, with swelling summits. These open a long strip-like lip and a second division of the corolla, which stands nearly erect, curved over at the top, and jagged into four. The stamens are five, long and graceful, as is the style, with a pin headed stigma. The germ is round, and becomes a red berry, with two seeds. Few flowers are more peculiar, or more graceful than the honeysuckle, and the delicious scent perfumes a whole garden. The wild sort is nearly all cream colour; but in gardens, the lips within are alone of a rich polished buff, while without, the flower is crimson, and nothing can be more pleasant to the sight than a cottage door covered with a bower of these blushing bright flowers, so quiet yet so cheerful, and shedding around such an atmosphere of sweet odours.

PLATE IV. AUTUMN-FLOWERS.

In Autumn, most plants are laying aside their gay robes for the more serious business of exposing their seed to the fostering sunshine, that it may be ripened before the winter frost. But some few will go on blossoming bravely, taking no thought that the cold will hinder their fruit from coming to perfection, and there are others brought from distant parts of the world, which will not give up their old habits to suit our seasons; and thus it comes that our gardens are still gay with autumn flowers. Of these one of the grandest is a friend from China, the tall HOLLY-HOCK (b), which lifts perfect spires of puce, pink, yellow or white blossoms in shrubberies or cottage gardens. It has large spreading leaves, a stem ten or twelve feet high, and large flowers of the mallow tribe, with five petals, and a column in the centre, consisting of numerous

filaments all united, and numerous styles all rising from a large round flat germ, which becomes something like a button, consisting of a great number of flat, wedge like seeds, which fit closely together and form a circle. That in the plate is double and therefore does not show the stamens. The remainder of the plants in this picture almost seem to contradict what has been said of every flower having stamens and pistils, but looking closely at them, it will be found that these are really clusters of tiny flowers or florets, all within one case. This race is called COMPOUND FLOWERS, and to it belong the DAISY, DANDELION, THISTLE and many others of our most common plants. The whole of the florets are fastened within the common involucre or case of leaves, to a flat receptacle, and they possess a tiny five-cleft corolla, a long slender style, a horned stigma, five stamens, and a cottony calyx, scarcely developed, until the flower is out of blossom, when it generally becomes a delicate feathery white wing to bear away the seed, upon the wind. This is what becomes thistle down, the soft cottony seed of groundsel, or forms the beautiful white globe which children call a 'dandelion clock' or in the HAWK-WEED. This feathery parachute is in a succession of stars, like magnified snow flakes. The thistle and dandelion have all their florets alike and equal, but most compound flowers have merely those in the centre, or eye, perfect, while those outside have no stamens, and only one petal which grows to a great length and forms the ray of the flower. It is the protection of the perfect florets within, as you may remember, that a daisy opens the yellow centre only by day; in early morning or late evening the pink and white ray is carefully closed over it. The rayed compound Flowers have in general a great love for the sun, and seldom open but when he shines upon them. Some actually follow him throughout his daily course, turn their heads to the east to greet his rising, watch him to the south at noon day, bend their face to the west as he sinks, close themselves and droop at night, but waken with their golden eye towards him in the morning.

In Peru, where the ancient inhabitants worshipped the sun, these, his faithful followers were regarded with great honour, and were used to adorn his temples. Two of the compound flowers here figured are Peruvian, and the chief of all is the great SUN FLOWER (*d*) which almost looks as if constant gazing had transformed it into the likeness of the sun itself, with that golden face and brilliant ray. It is a very large and handsome plant; but the stems and leaves are rather coarse, and it is not often seen except in cottage gardens. The large grey seeds have no wing, they are full of oil, and are sometimes used for feeding poultry. The Flower is still in favour as an emblem of the Christian faith ever looking towards Heaven. What we call the FRENCH MARY GOLD (*c*) is also Peruvian; the central florets are well developed, and the strap-shaped ones, very handsomely marked with orange and deep brown red, but the smell is very unpleasant. The DAHLIA (*a*), in the plate is doubled, by the strap shaped florets of the ray having been multiplied to the destruction of the great yellow eye of perfect florets which is found in single Dahlias. This handsome plant was brought from Mexico, and named after the German Professor Dahl. The ray has not only been multiplied by cultivation, but taught to take all manner of beautiful colours, orange, puce, purple, yellow, white, or white with each petal dashed or edged with some darker colour. Each variety has a name, and they are great favorites with flower fanciers while the large size, and the firm texture of the flower makes it very useful in forming mottoes or ornaments, upon great occasions. Dahlias seem unwelcome as the first signs of autumn, and yet they are kind in forgetting that this is not warm Mexico, and giving us their handsome blossoms even till the frost and wet has made their shining scaly involucre one sodden yellow mass, and blackened every young petal.

The CHINA ASTER (*e*) is the Chinese brother of a large handsome family of ASTERS or STARS, of which we have one wild friend, the lilac-rayed, yellow-eyed sea star-wort. The Michaelmas Daisy is another of the family, and there are many others, of which the largest and handsomest is the Chinese, often doubled, and brought to various brilliant shades of purple and pink.

PLATE V. WINTER-FLOWERS.

In winter we are grateful to any blossoms that will shew a cheerful face in the time of snow and frost, and thus we greet as friends, three plants which if they blew in any month but January would be looked upon as of the race of poisonous plants, instead of as Christmas flowers. THE BLACK (*a*) YELLOW (*d*) and GREEN (*e*) HELLEBORE are all five petalled, many stamened flowers, with creeping roots, which grow high on the Alps and Appenines and thus are used to cold weather. They are highly poisonous, but can be made useful for medicine. The Black hellebore has however the much prettier name of the CHRISTMAS ROSE, in honour of the white flowers, touched with red, which deepens as the blossom grows older. The Yellow has a pretty calyx, divided like wings, and a bright cheerful polished flower, shining like a butter cup with the peculiar polish that many of the ranunculus tribe have. The common name is the YELLOW ACONITE. The Green hellebore or BEARS FOOT is sometimes found wild in England, it is a handsome plant, with green flowers tipped with purple, but it has a very unpleasant smell and is chiefly valued by old fashioned herbalists, who use the hedges as their medicine chest.

There is a shrub which enlivens the garden with white blossoms, and rose coloured buds, upon red stems. This is the LAURUSTINUS (*b*) a native of southern Europe and northern Africa, yet not afraid to face the cold of an English winter. It belongs to the same genus as our native GUELDER ROSE, and wayfaring tree, namely the VIBURNUM. These are shrubs, with leaves in pairs opposite to each other, the blossoms growing in what are called corymbs. These are clusters of small branches, such as bring the flowers close together in a spreading, flat head. The corolla is in one five-cleft petal, the calyx very small, the stamens five, the pistils three, producing a berry. This in the Laurustinus is deep purple and serves the birds for food in early summer, before other berries are ripe.

PLATE VI. KITCHEN VEGETABLES.

Most children begin by thinking that flowers are not vegetables, and that vegetables are not flowers, but only those leaves, roots or fruits which we eat with our meat. But we have found that both alike belong to the vegetable world, and if the gardener lets his plants run to seed, you can soon be convinced that the kitchen garden contains flowers, almost as pretty as if they were grown for ornament. We of the human kind, are the only creatures, except bears, who need to live on both meat and vegetables, and have teeth fit for both kinds of food. In the very hot parts of the world, mankind can exist pretty well without flesh to eat and in the coldest climates, without vegetable diet, but in the temperate zones, man can hardly be healthy without meat to keep him warm and strong, and vegetables which by their starch and gluten correct the oiliness of the meat, especially of fat meat.

Do you wish to make acquaintance with the venerable fore father of most of our best vegetables. Then you must go to the sea coast, and look for a plant named BRASSICA with sea green wavy leaves, and a branched stem, bearing yellow blossoms, these flowers belong to the order called CRUCIFORM, or cross-shaped, because the four petals spread out from the deep and somewhat swelling calyx in the exact form of a Greek cross, veiling deeply within them four long and two short stamens, and a long thick pistil, with a cleft head already taking the form of the longpod or SILIQUE which it will become when the seeds are nearly ripe. The plants of this kind are not Endogens, for though the stamens are six, the other parts go by fours and the stamens are always four long, and half four short, and besides the seeds are two celled, and put forth two leaves. It is an unvarying rule that every one of this cruciform race is wholesome; not one of them but may be eaten without fear: and in fact they seem to have been appointed as the great staple of vegetable diet in temperate climes, for scarcely one is found in hot countries. As such useful friends, we may pardon them for having little brilliancy to boast of, the flowers are always either white,

yellow or sometimes pale purple, and so small that very few have been admitted to our flower gardens. Nearly the whole list may be comprised in the Wallflower and Stock when doubled, the Candytuft, and *Arabis Siberica*. But to return to our yellow flowered Grandfather of Cabbages; the Brassica by the sea side. Many and many years ago; a craving for green food seems to have taught our forefathers to gather his leaves, and carry his roots into their Gardens. There, better soil made them improve, and the English called them COLEWORTS, the Germans KOHL and KRAUT (or herb) the Scots KAIL, nay the very garden was named after them the KAIL-YARD. But further care and careful manurings and watching did more for old Brassica's grandchildren. You may see his lineal descendant full spread as the CABBAGE (fig. a) (though much too small), who has learnt to enlarge his leaves, and multiply them without number, forming a huge leaf bud in the centre, which we eat with great satisfaction, enjoying the juicy midribs and the infant leaves, folded up tight within, and white for want of light. The Cabbage has another brother who grows to an enormous size, but who is chiefly used for cattle, and therefore called the Cow Cabbage; and another which has been brought to assume the richest purple or crimson tint, all over the leaves, which are generally sliced up small with vinegar, as companions to roast beef. Another of the Brassica grandchildren spreads out such a large mass of young flower buds, all closely compacted together before they are yet developed as to tempt people to taste them; and these are what we eat under the various names of CAULIFLOWER (*b*) (*Coleflower*) and BROCCOLI (I suppose from the old name *bore cole*) and which the Germans allow to ferment and enjoy as SOUR KRAUT. But the obliging Brassica family has done yet more in our service. Another brother of the old Sea Colewort, with the like yellow flowers, but with rough bristly leaves, finding perhaps that there was no more hope of our eating his leaves than of eating a hedgehog, devoted himself to his stem. Above ground he produced a great purple swelling which is called a KOHL RABBI, and eaten by cattle; but under ground the stem was much more successful and the large white ball, slightly tinged with purple, that it produced is called a TURNIP and appears as fig. b. The turnip consists chiefly of gluten, with a little starch and sugar, and a good deal of water. It has less fat in it than almost any other vegetable, which is the reason it is eaten with boiled mutton and beef, and is often given alone to sick people, who would be hurt by more nutritious food. It is however chiefly grown for sheep and cows, who live on it great part of the winter, especially on the large kind with smoother leaves, called the Swedish turnip, which is very unpleasant to our taste. These coleworts of all kinds were the chief, indeed the only vegetables much grown till within the last two hundred years, and they have been very much improved by being watched and cared for.

Another notable plant of the cruciform order is "the pungent RADISH, biting infants tongue" with the beautiful crimson underground stem whence depend the little fibrous roots. Most country children have had the pleasure of sowing their own radish seed, of watching the two cotyledons come up, fall off, and give place to the lyre shaped leaves, and by and by of pulling up and washing the roots, till their bright red colour shines out so cool and fresh, and then of ranging them in rays, round a plate full of water to keep them glossy. The sharp pungent taste is generally the least agreeable part of the affair. Some radishes are of the long tapering form of that in the picture (fig. d) rather a larger one than we should wish to eat, others which are called turnip radishes or globe radishes are round like a ball. They all have a yellow cruciform blossom, and are derived from a wild rough kind, not useful in itself.

There is a large race of plants with five stamens and two pistils growing in little insignificant green blossoms clustered round a jointed stem, often tinged with pale pink, and with large leaves of a long heartshape. These grow wild all over England and are called Goosefoots, they are wholesome and have much sugar in them, and for that reason, one sort, called Fat hen or Good king Henry, used

to be a favorite herb, in the days when cabbage was colewort.

Another kind, much improved, is still grown in our gardens and eaten as spinach, with the leaves chopped fine; and another, a near relation, is THE REDBEET, whose root appears at fig. e. The leaves of the Beet assume a fine deep purple polish, their footstalks are beautifully striped with shades of pink, and the root is in rays of the most beautiful deep dark crimson on a some what lighter ground, when eaten with cold meat. It is so full of sweetness that a German Chemist discovered that sugar could be made from it, and when in the time of the war with Napoleon I. canesugar could not be imported into France, the manufacture was begun, and is now carried on to a great extent in Germany and France, where the plant is grown in fields. The root is taken up, crushed, the juice is washed from it, boiled, and left to crystallize into sugar.

Five stamened and two pistilled, we likewise find another great race of plants called UMBELLATE, because their stems and blossoms are arranged like the spokes of an Umbrella. They generally have large solid roots, straight hollow main stems and leaves growing from the root and generally cut, carved and divided infinitely and very beautifully. The stems bear umbels, namely little branches, six, seven or eight in number spreading out like rays from one centre, and all exactly of the same length, up to a second division of lesser spokes, each of which support a very small flower with a long calyx, and five petals, one rather larger than the rest, and the outer blossoms larger than the inner ones, so as to make a sort of border round the cluster. The seed vessels are oval, some pointed, others rough and flat. The flowers are all white or yellow, and the sole beauty of the plants is in general the extraordinary regularity of the umbels, the fluting of the stem, and the delicate patterns of the leaves. These umbellate plants are naturally full of acrid juice and are in their wild state very poisonous, but by growing in good ground some of them correct their evil qualities, like children under education, and become useful and excellent for food.

One of these is the CARROT (*d*) a plant with white flowers and long bracts (or leaves below the footstalks) hanging down from each umbel. The leaves are large, elegantly cut and curled, and when growing in unfavourable soil, assume the most beautiful variety of colours, some green, edged with crimson, or with yellow, red tipped with green, pink with orange etc.; no two plants alike, and all more beautiful than any one can imagine, who has not gathered an autumn nosegay from a field of carrots. The root becomes of a bright orange colour and so full of nourishment that, besides being grown in gardens for the table, the larger roots are raised in fields for cows and horses.

The wild celery is likewise poisonous, and indeed the GARDEN CELERY pl. VII (fig. c) would quickly become so, did not gardeners take care to keep it from the light, which would draw out the lurking acrid juice and make it unwholesome. They earth up the roots as fast as they grow, forcing all the leaves to the top, and making the footstalks white, thick and very crisp, so that they are excellent when eaten raw with bread and butter, but even then the tops which have seen the light have an unpleasant taste which shews that they come of no good kind. When allowed to blossom, it has a very small umbel of little white flowers.

At first sight you would not suspect the ONION (*d*) of being not distantly related to the Lily and yet it really is like it in many points, with the same single pistil within the six petals and six stamens that shew it to be an Endogen as plainly as does the single bud, which shoots from the bulbous root or underground stem. The flowers, however, instead of growing in graceful bells, like the "lilies of all kinds," are arranged so as to form a large globe, consisting of the little starlike blossoms; a very handsome cluster, but not one that it is advisable to touch. Before blooming, instead of each flower having a private calyx of its own, the whole head is enclosed in a thin, veined spathe which hangs down afterwards, from the top of the hollow stem, which is larger at the bottom than at the summit. If the seeds are not sown, they will sometimes go on to produce bulbs at the top of the stalk, even

in the open air, and the bulbs are beautifully constructed, coat within coat, of smooth white, with the embryo plant packed closely within them, provided with such a quantity of nourishment that it can begin to grow without even touching the earth. It is this support for the bud that makes the onion one of the most useful of the plants used for food, and the peculiar taste seems to be given to it for the sake of directing man to live on what is so whole some. The poorer classes in most countries, and above all in Spain, eat it eagerly with bread and cheese. Different kinds are to be found native to most parts of the Temperate Zone. We have the wild GARLIC or 'ramsons', a plant with handsome white flowers, but with a horrible smell and a taste which it imparts to the milk of cows which have eaten it; the 'CROW GARLIC' like a little onion, and several others of which the lovely blue 'VERNAL SQUILL', is the rarest and most beautiful. The LEEK is the national badge of Wales, and is always worn on St. Davids day because (on the authority of Captain Fluellen), the Welshmen of the army of the Black Prince did good service against the enemy in a field of leeks in one of the battles in France, each mounting one of the savoury vegetables in his cap, in memory of which, every patriotic Welshman wears the like on the feast of his national Saint, and at Eton the Welsh boy of highest rank presents one of silver to the head master.

PLATE VII. KITCHEN VEGETABLES.

Of all our Garden plants, none is so precious to us as one only known in Europe for the last 300 years, and one which in spite of its valuable properties, is very nearly related to poisons. Few of us like to dine without the round mealy floury POTATO, (fig. b) which by its starch and gluten corrects the greasiness of the meat that we eat, and there is many and many a cottage where the potato is the only dinner, either with or without a little butter or dripping to moisten and give it a relish. Yet this excellent article of daily fare is one of the SOLANUM tribe, the same to which belongs the dangerous BITTER SWEET (Pl. XXI fig. b.), whose flower is very like that of the potato. The potato blossom is so pretty that it would be grown for ornament, even were it useless, the corolla of a single white or lilac petal, contrasting prettily with the peak of fine long yellow Anthers, meeting and projecting in front like the point of an ancient British shield, while the corolla is turned back so as to protect the germ which grows behind it, and which becomes a round hard berry, the blossoms and berries growing in drooping clusters amid the leaves, which consist of six small leaflets opposite to each other, with one at the point. It is in this berry that all the poison of the potato resides, and the first plants which Queen Elizabeth's great Mariner Sir Walter Raleigh grew in his garden at Youghal in Ireland, were very near being lost, when his servants made the first experiment by tasting the fruits instead of looking underground; a mistake for which the Irish have since made up, since theirs has ever since been above all the land of potatoes, and the choicest diet in the world would be nothing to them, were the "praty" missing. Underground, the true roots are a network of fibres, but where they cross, there spring the next year's buds, in the midst of a tuber or ball, consisting of starch, gluten and sugar, intended to support the new plant, but to which we take the liberty of helping ourselves, calling the buds, the eyes of the potato, and cutting them out before using the tuber for food. When potatoes are planted in the late winter or early spring, the field is ploughed, or the garden bed ridged in furrows, and the tuber is cut into slices each containing one bud, which are set at proper intervals, earthed up, and left to grow. They flower in the middle of the summer, and are a very pretty sight, full of promise for the winter's store, unless that strange blight, the potato disease, should pass over them, blackening the leaves, spreading a peculiar odour of decay all around, and finally corrupting the roots themselves. The prevalence of this disease has rendered the potato a much less certain crop of late years, and somewhat less universally the food of the poor, but a good year for potatoes is one of the greatest blessings that can befall the country, since it is a most valuable addition to the scanty cottage fare. Men,

women and children come out in October to dig up the tubers from their furrows, clear them from the earth, and separate into different baskets, the large ones fit for the table, and the lesser ones, only fit for the pigs; and it is a sadly anxious time to many a poor family, for upon the state of those roots does it depend whether they shall be hungry nearly all the coming year. There are many varieties of potatoes, large and small, red skinned or white skinned, keeping for a long or a short time, ripe early or ripe late; but they all come from the small kind which Sir Francis Drake and Sir Walter Raleigh brought home from America because they saw the Indians living upon it.

America is much endowed with these plants with the floury tuberous roots. YAMS and BATATAS are also American, and so is the JERUSALEM ARTICHOKE fig. a, a tall sunflower with a tuberous root, coming from Peru, as to the name of Jerusalem, that is only a corruption of *girar-sole*, go round with the sun, the Italian name belonging to it as a sunflower.

It must have been called an Artichoke from the taste, resembling that of the receptacle of the true ARTICHOKE (fig. a); a noble plant with strong hard leaves, serrated at the edges, and buds consisting, like those of all compound flowers, of scales, laid closely one over the other, and all set into a large shield like receptacle. This receptacle, and the scales are full of fleshy glutinous substance, intended for the support of the flowers, but when boiled becoming soft and nutritious. The portion at the bottom of each scale is dipped in melted butter and bitten off, until scale after scale being removed, the young flowers become visible, and are called the choke (they certainly would choke any one who tried to eat them) and these being pulled off, the solid and excellent receptacle remains to be eaten. Such of the buds as escape coming to this end, open into splendid blue compound flowers, slightly shaded with lilac, and with their forest of tall styles, looking like azure crowns in the midst of the kitchen garden.

It is the flower bud of the Artichoke that we eat, but it is the whole young sprout of the ASPARAGUS (fig. a) that we devour, an excellent specimen of the growth of an Endogen, coming up so thick and solid all at once, the scaly leaves overlapping the round head that the French call the thumb of asparagus. So hard do the stems become that only the topmost bud is softened by boiling sufficiently to be eaten, by any one at least except King William III, who taught Dean Swift to do the same, and it is said that the Dean looked so extremely stern and sour at such as did not follow his example, that his guests did not dare to be dainty as to their asparagus stumps in his presence. The asparagus is a plant so full of life and vigour that the more the buds are cut off, the more it resolutely thrusts up, and after the hopes of the persevering plant have been thwarted for about six weeks in the summer, it is left in peace, to let its thumbs grow up into a forest of graceful waving miniature trees, with branches from the main stem, bearing tufts of leaves like bristles, and small green lily flowers, their parts of course in sixes, and giving place to scarlet berries, which look very pretty when the whole plant has turned yellow, as it dies down for the winter. It grows wild on the sea shore on the south western coast of England, though much smaller, tougher and harder than cultivation has made it.

It is the leaf stalk of the RHUBARB (fig. b¹ b²) that furnishes the earliest tarts and puddings of the spring. The Rhubarb is a large African dock, and most children know the sharp pleasant taste of the stem or leaf stalk of the little red wild sorrel or dock, some times called Cuckoo's Bread and Cheese. These plants have a tall straight spike of small flowers, three petalled, three pistilled and six stamened, a single stem, large handsome leaves veined with red, and full of acid juice, and a straight tap root, which dried and grated furnishes a useful medicine.

Before Rhubarb was brought from Turkey a wild dock was grown in Convent gardens by the monks, who used to be the great doctors; but it was not for a long time that the more agreeable way of using the leaf stems was discovered. Little more than 30 years ago, the first bundles of Rhubarb were brought to Covent garden market, only three out of seven were sold, and people laughed at the notion of physic pies — whereas now, waggon

after waggon goes creaking in early morning into London, laden and piled up high with the stout hard crimson stems cut from the fields of the nursery Gardeners, where grow multitudes of the plants, bearing the enormous leaves, the biggest perhaps that grow in our country.

The PEA (fig. c), the BEAN, and SCARLET RUNNER, (fig. d. e) all belong to a very pretty and curious race called PAPILIONACEOUS or butterfly flowers. They always have five petals beautifully arranged. Above stands one single large one, called the Standard, whose work it is always to keep its back to the wind or rain, and shield the others. Thence grow two lesser ones called the wings, which close over the two innermost. These are joined together beneath so as to form a little ridged boat, the keel as it is called, containing the ten stamens, whose filaments again are united so as to form a covering round the pistil, all but one which is left loose that the germ may have room to grow. It is a long narrow germ, and, after the blossom is fallen off, becomes a pod, containing six seeds, fastened alternately to the sides of the case. Some people have said that the pod is like the caterpillar, the flower like the butterfly, the round seed like the egg — but think of it as we will these papilionaceous flowers are some of the prettiest and most valuable that we possess. Most of them have weak stems, and cling to some support by pretty spiral or branching tendrils, and their leaves are usually very regularly arranged. Our garden Pea has blossoms like a white butterfly, sea green alternate leaves, and a pod containing seeds, most excellent when young and green, and when hard and dry, very good for making soup, and often given to pigeons. Pulse or hard dry pease, being easy of carriage, has been often Pilgrim's fare, although nothing can be more uninviting.

The broad Bean is a lower plant, not needing support, and with a beautiful white flower, the standard adorned with a jet black spot, and so carefully rolled up that Bees can only steal the honey by drilling a hole through the base. The large grey fruit grows in pods, and has always been the trusty comrade of bacon at the dinner table. A smaller sort is grown in fields for horses, and gives a delicious smell when in blossom.

Scarlet runners grow to such a length so quickly that they may be supposed to have furnished the beanstalk by which Jack climbed to the moon. They have heart shaped leaves, brilliant scarlet flowers, and seeds of a lovely pink at first, and afterwards polished black variegated with lilac, a favorite plaything for small children, but they are not often allowed to ripen many seeds, for the portion usually eaten is the young seed pod, chopped into long narrow pieces and boiled. The bright blossoms make the scarlet runner very ornamental.

PLATE IX. PLANTS USEFUL IN DOMESTIC ECONOMY THE ARTS etc.

Many plants, though not directly used as food are exceedingly valuable, either as ingredients in the preparation of food, as medicine, or as clothing.

Among the first of these stands the HOP (a), one of the most graceful as well as the most valuable of plants. It has a long weak stem, of very tough texture, but unable to support itself. And therefore clinging to any support that it can find, twisting as it grows, so that the veins go spiring round the stem, which is all over rough prickly short bristles, the better to take hold. The leaves are of the beautiful form named pinnate, or winged, having one or sometimes two wings parting from the foot stalk, like a vine leaf. The blossoms belong to the race which have the stamens and the fruit bearing blossoms growing from separate roots. The barren flowers grow in small spikes, the corolla is green, and contains five yellow stamens, but these soon die away, and are seldom noticed. The fruit bearing blossoms are in most graceful green catkins, consisting of green scales, growing one over the other, the largest uppermost, so as to form a large loose drooping cluster, round above, pointed below, and about as large as a Blackbird's egg. Under each scale is a single carpel, bearing two styles. The catkins grow near together, on foot-

stalks, hanging down, and ranged in spiral lines on the branch from the main stem. There is a wild ease, a regular irregularity which makes the Hop so beautiful that it would be grown for ornament even if it were of no use. And nothing can be prettier than it is, trained round a porch, or following its own wild will on a hedge side. But though we often see it wild, and many of us have enjoyed gathering the young shoots in the hedge, to be boiled like asparagus, it is not a native. There is an old rhyme which tells us that. "Turkeys, Carp, Hops, Pickerel and Beer came to England all in one year." And that year was in the time of King Henry VIII. Not but what there had been beer, or at any rate, ale in England ever since there were Anglo Saxons, but they put into it the blue ground ivy which they therefore called ale hoof, before the Hop was brought from Flanders, with the French name Beer, which, probably means something to drink.

Hops were at first grown all over England, and thus spread into all the hedges and woods, but there was a duty imposed on the selling them which checked the cultivation, and they are now chiefly grown in Kent and Sussex, where large fields are yearly planted with them, and poles about three yards apart are set for their support. A Hop field with this multitude of green garlands is a beautiful sight. There is one enemy, the hop aphis, a little insect, which often does great mischief, but is kept in check by crowds of the little scarlet Lady bird. — This pretty creature likes no food so well as the aphis, and is thus the greatest friend of the hop grower. Hopping, as the gathering in the hop catkins is called, begins just after harvest. The plant is cut down, so the poles are taken up, and men, women and children turn out in crowds to gather the green bunches. They are then stored in great sacks, called pokets, like huge bolsters, generally marked with the horse, the ensign of Kent and sold to be put into beer. The bitter taste and narcotic, or sleepy quality of Beer is owing to the Hop, which has a very peculiar and refreshing smell, making a hop garden exceedingly pleasant and wholesome. A pillow stuffed with hop catkins is sometimes found beneficial in soothing the nerves and inducing sleep. In the time of his first attack of insanity, King George III was greatly calmed and refreshed by using a hop pillow, which gave him sound and healthy sleep.

It is to a very different use that the next plant in the picture is applied, neither serving for food nor for dress, but yet so valuable in the preparation of dress, that the clothier's ensign is three heads of TEASEL. (b)

The Teasel belongs to the race called aggregate flowers, namely those which flock closely together within one common involucre like the compound flowers, but unlike them have always perfect florets, and follow the rule of four instead of five. The pistil is single, the stamens four, the lilac corolla of one petal, divided into four, the deep calyx in two divisions, the upper short, the lower very long, and both adhering to the seed. The blossoms are all packed so closely together as to form an oval head, whence the long calyx leaves stretch out on all sides, so as to form a complete array of bristles garnished every where with minute hooks, such as would scratch and tear any enemy to the delicate flower, which blossoms within this head 'well armed with pointed spears,' in circles, a single wreath round the head opening at a time, so that the Teasel is crowned with a gradually ascending fillet of lilac. The involucre consists of four long prickly pointed leaves, the stem, also hard and prickly, is perfectly straight, upright and regular bearing the one main head in the middle, and sometimes at the joint in the stem, putting out two straight branches opposite to each other, each bearing a lesser head. The leaves, long, taper, pointed, and with each midrib armed at the back with angry hooks, grow in pairs, opposite to each other, and without footstalks, so that the large ones at the lower part absolutely join together and make one single leaf, or cup round the stem, so deep and firm as to form a pool of water, caught from the rain or dew, and there retained to nourish the plant. For this reason it was named DIPSACUS, from a Greek word meaning thirsty, and it has also been sometimes called VENUS'S-KETTLE. Our word Teasel must come from the fretting, fraying or teasing of the little hooks, catching hold of threads, and never letting go. Yet it is in

these hooks that the value of the Teasel resides. No instrument devised by man has ever equalled them in delicacy, and they are the only means which has yet been devised of raising the nap in cloth, without pulling it to pieces. For this purpose large fields of them are grown in the clothing counties and kept well manured, without which the hooks are wanting in strength, the large central heads of the leading shoot are cut off, fixed in frames according to their sizes, and drawn across the cloth, as it lies stretched out upon a table, the prickles first sufficiently raising the wool to prevent the texture from looking coarse and threadbare; and thus forcing man to confess, in the very centre and pride of his manufactures, how much more skill and perfection there is in the most common of his Maker's works, than in all his boasted contrivances, the fruit of so much thought and toil.

Of the next plant, the POPPY (*c*), there is a less pleasant account to give. It is one of those bestowed on man for his good, which he has turned too often to an evil purpose.

The poppy is a handsome plant, with curiously cut leaves, a stem full of milky juice, a calyx of two divisions which split asunder as the flower opens, and finally fall off on either side, displaying five large brightly coloured petals, loosely attached beneath a wreath of innumerable purple stamens, surrounding a large green germ, shaped much like an urn, and crowned with a handsome flat stigma, ornamented with velvety purple rays proceeding from a centre. The petals and stamens soon fall off, but the urn remains, and becomes hardened, and within divided into five equal compartments containing numerous round seeds. As these ripen, the ornamental stigma, or covering of the urn, is gradually raised upon little supports, so as to leave openings for the seeds to receive the air, and by and by as the plant dies, it bows its head, so that they drop out, through these little holes — one of the most beautiful contrivances to be found among the whole wonderful race of seed vessels.

There are a few wild poppies in England, the most common of which is the field poppy, the only scarlet English flower except the little Pimpernel.

The large pointed scarlet petals are rendered all the more brilliant by the jet black spots at the base of each, and so beautiful is the bright glow of the plant, scattered in the midst of the corn, that it is a pity that the multitude of these splendid blossoms is a proof of poor land or a careless farmer. And the field is but "unprofitably gay." — It is not easy to add them to a nosegay, for at a touch, the petals are detached, and the poet Burns has therefore made them stand the first among the emblems of the transitory nature of selfish enjoyment.

"But pleasures are like poppies spread
You seize the flower, its bloom is shed."

The poppy in the plate is not wild in England, but is sometimes grown in gardens, where the white marked with purple, lilac with black, scarlet edged with white, and all manner of other varieties, are very ornamental, though not very loveable, and the scent any thing but fragrant. The smell, the milky juice, and especially the seed vessels of the flower are full of narcotic or sleepy influence and for this reason, Morpheus, the Greek God of dreams, always bears a poppy as the emblem of slumber. — Thus the dulling and deadening power of the poppy has often been found a great blessing in lulling pain and restlessness, and the medicines called Opium and Laudanum have been prepared from it. Taken in large quantities, laudanum will however lead to a sleep whence there is no awakening, and opium, when used constantly, either for eating or smoking, brings the mind and body into a strange dreamy condition, either drowsy or excited, which becomes such an indulgence that it requires unusual strength of mind to shake off the habit.

The Turks and the Chinese are greatly addicted to this pernicious custom, and far too many Europeans have recourse to Opium to drown their cares, by stupifying their senses, thus changing the medicine so beneficently appointed for them into the means of destroying all their vigour and energy.

The Opium poppy is grown chiefly in India, especially at Malwa, where it is planted in large fields, most beautiful and gorgeous when in blossom, since the plants of one colour

are sown together, so that in one place is a large patch of snowy white, close to another of rich purple, and further on a field of dazzling crimson, all under a southern sun, making them almost, too brilliant to be looked at. When the fruit is nearly ripe, a little knife, with many small blades, is thrust into the outer skin of the urn, when the milky juice oozes out, it is left to dry for twenty four hours, then scraped off by the natives, and when every particle of moisture has been squeezed out, it forms a dark brown paste, which is made into pills either to be eaten or smoked.

The last plant in the plate is the pretty blue flower, CHICORY (*d*) or wild ENDIVE, a compound flower of the tribe which has all its florets perfect, each with a handsome strap shaped division of the corolla, jagged at the outside, and growing from the little cup containing the five united stamens, and the tall pistil with the forked head — the same race as the Artichoke and Dandelion. The Chicory has a beautiful sky blue blossom, and a branched stem, and is fond of haunting road sides, where it smiles out in spite of dust.

The leaves are good to eat as salad, and very wholesome for cattle, and the root is solid like a parsnip, and full of bitter juice. This has caused it to be used as a sort of cheap coffee, and it is grown for the purpose in Surrey, Bedford and York, and to a much greater extent in Germany and Belgium. The root is taken up, washed, dried, and sliced, then roasted with lard, till it becomes of a dark chocolate colour, when it is ground and sold with coffee, to which it gives a strong bitter taste.

PLATE X.

The HEMP (*a*), has more likeness to the hop in growth, and to the poppy in use, than would at first appear, but even the leaves follow the rule of five observed by the hop, and the five stamens and two pistils are on separate plants. The barren flowers are purple, growing in whorls round the stem, the fertile have neither calyx nor corolla, only two large seeds under the leaves. The chief likeness to the hop consists in the strong tough fibres of the stem, and these are the portion most important to us in Europe. The plants are from five to six feet high, sometimes twice that height; they are grown in large fields in Russia, Spain, Germany and many other countries, and sometimes in England, chiefly in Suffolk, where the hemp, is of a finer quality, but much smaller than any where else. When ripe it is pulled up, the stems are stripped, and put into water to rot away the surrounding part from the tough fibres. It is afterwards beaten with hammers into soft fibrous tow, and then combed out and spun into threads, which are sold either to rope makers or to canvass makers.

What would become of our British sailors without their stout canvass sails, that so gallantly withstand the wind, let it bounce, roar, and growl round them as it will, seeming to be trying to rend them to pieces? Or where would they be without that wonderful network of rigging by which they climb to the top mast; or without the giant cables that hold the Anchors fast, defying the water to spoil them? Or how would the fisherman spread his yards and yards of net without stout twine? What should we do for sacks for our corn, our coal, our hops, if there were no hempen canvass — nay what would little boys do with their kites, or where would they get the piece of string that they always have in their pockets? Great or little we make a better use of our hemp than do the Eastern nations. Every one knows the smell of hemp, even whip cord has it in some degree, and rope yarn a great deal of it, in spite of all the washing and dressing it has undergone. This is owing to some of the same narcotic qualities that the hop possesses, and in hotter countries the plant is cultivated for this cause, instead of for the fibres. A sort of gum exudes from the plant, which is either gathered by the hand or beaten off by a wooden mallet, or the leaves are boiled and mixed up with butter, camphor, and other perfumes into a drug called hashish, which has the same effect as Opium. The Turks and Arabs either smoke it, or eat it and fall into a state either of dreaminess or frenzy, and it is even said

that our word assassin is derived from haschisch, because the Saracens, who sometimes broke into the camp of the crusaders meaning to commit murder, had maddened themselves by the use of this drug. So the hemp may be said in the East to commit the murders, in the West to punish it. The seeds of the hemp are much used for the food of caged birds, especially parrots, but from their fattening and perhaps their narcotic quality, all bird lovers know that the staple of the food of their smaller pets must be the pretty shining seeds of the CANARY GRASS (*d*), a graceful plant, like miniature wheat. It is grown in the Isle of Thanet, and the seeds are thence sent to fill the small larders of many a merry little yellow bird, whose strong bill well knows how to act as flail and winnowing machine, scatters the bright chaff over his sanded floor or hurls it over half the room, and further requires neither windmill nor oven. The blossom will find a description among the grasses. Sweet and delicious LAVENDER (*e*) with its sober grey flower and most charming perfume, belongs to a class called LABIATE or lipped flowers, of a single petal, with a deep throat, and four stamens two much longer than the others. The pistil is one, with a long style that falls off, leaving four round seeds in the bottom of the calyx. All the Archangels or dead nettles, the ground ivy, the thyme, marjoram and many others belong to this tribe and those with the naked seeds have generally a strong aromatic scent, so delicate and fragrant in the lavender that it is grown in many Gardens for the sake of gathering the whorls of blossoms, sewing them up in muslin bags, and putting them to sweeten pocket handkerchiefs, and other contents of our drawers. In Surrey, as well as in France and Italy, whole fields are planted, and the essence where the scent resides is distilled from the blossoms and sold diluted as Lavender water.

MUSTARD (*b*) is one of the yellow cruciform race, bearing smooth leaves and siliques containing the round seeds, so often destroyed by "that same giant ox beef." — Like the radish and horse radish, it is full of pungent flavour, very useful as a stimulus in correcting the greasiness of the said heavy Giant, and is therefore much used, when ground up and moistened with water.

English mustard is chiefly grown at Durham and Tewkesbury, and for its stinging qualities is often used to excite irritation on the skin, when mixed with the milder Linseed, the fruit of the plant next ensuing.

PLATE XI.

FLAX (*a*). The Linseed when beaten flat, so that some of the oil is squeezed out, for the use of painters, is made up into oil cake as it is called, for the fattening of cattle. Flax has however a far more notable use, more worthy of its fair tender blue flowers, with five pistils and five stamens, with azure blue anthers. It has the fibrous stem of the hop and flax, and from the very earliest times these fibres have been spun and woven into LINEN, so called from the Latin name LINUM, and its other name USITATISSIMUM well expresses that it has always been *very much used indeed*.

In Egypt, where it grew near enough to the Nile to share in the inundations, it was so important a crop as to be mentioned among the plants destroyed by the hail, and indeed the fine linen of Egypt was used for garments, for the swathings of mummies, and for commerce, so much that it must have been one of the greatest losses inflicted during the ten plagues. Rahab hid the spies in the stalks of flax laid out to dry on the flat roof of her house and while white fine linen is mentioned in the Bible as one of the greatest articles of luxury, "he that is clothed with a linen frock" stands as the lowest rank. Soaked, beaten, spun, and woven, much as has been described with hemp, flax furnished all the lighter garments of mankind for many centuries, and was grown almost every where, and even now, it is the best and stoutest material, as well as the finest and most delicate, and furnishes the strong unbleached holland, the firm shining Irish Linen, the fair white lawn and cambric, and the delicate Lace that seems to imitate frost work. The gloss is almost equal to that of silk, and it is only what is strong in texture that can afford to be so fine as the threads of lace.

Silk came in, to put linen somewhat out of fashion and in time was followed by COTTON (*b*), a pretty yellow flower, with stamens growing together round the pistil, like those of the Holyoak, and with such an unusual amount of silky white wool growing in the seed pod, that the original inhabitants of South America had found out that it made excellent wadded breastplates to defend them from arrows.

From them the Spaniards learned to call it Algodon, the word that we have turned into cotton.

At the same time another species growing in India had been long woven in the little handlooms into the beautiful white soft fabric that furnished the long sweeping garments of the Hindoos, and the splendid white folds of their Turbans. Such a covering was needed to keep off the burning heat of the sun from the head, and even in battle, warriors wore the full light folds which might often serve to turn a sword cut; or if a mortal wound were given, the soldier was often carried from the field, wrapped in the ample folds stretched out to serve as his winding sheet. The perfection of the art was to make a piece many yards in width, so soft and fine that it could be drawn through a ring. This delicate fabric is called muslin from the town of Mosul, and that which is a little stouter calico from Calicut. Little did the first importers of calico guess the full value of the material, or the difference it would make in England. Linen though it can be easily grown in Britain is somewhat expensive, but the abundance and softness of cotton makes it far cheaper, where there is traffic enough to make the cost of carriage less important, and enormous quantities are grown in India and Carolina, whence monstrous sacks stuffed with the soft white cotton wool are transported to Manchester, and the other towns where it is spun into thread, and woven into calicoes, prints and innumerable forms, almost all cheap, and not only enabling our own poor to afford much more comfort and cleanliness than ever before, but being sold throughout the world, where English printed calicoes are met with in the most strange and remote places, the most gaudy being generally preferred by the most savage nations. It is the soft bed of the seeds of one little yellow flower that sets to work that mighty world of stamping, tearing, whirling steam engines that work on with untiring activity, and have made England the mightiest commercial country in the world.

The little CORIANDER plant (*c*) has not quite so wide a use. It has pinnate leaves, and umbellate blossoms producing seeds that are crushed and used in medicine. In other parts of Europe, they are put into bread to give it a flavour, but in the South, it is found a troublesome weed, as it becomes so luxuriant as to overgrow the wheat in the same field, and if bruised the scent of the stem is exceedingly unpleasant.

The RUSH tribe are endogens, and some of the simplest plants in creation, with scarcely branch or leaf, only straight stems bearing the bunches of flowers, and very poor flowers they are; only a few scales containing three stamens and one or two pistils. They grow chiefly in wet places, and their single stem is furnished with an unusually strong, tough case, containing a quantity of soft pith, they bend with every wind, but cannot be broken without the greatest difficulty, and this has made them valuable for plaiting and weaving into baskets.

The ark in which Moses was placed on the Nile, was of some of the great reeds of the Nile, though probably not of such as we have here.

The rind of the Egyptian reed first furnished paper for writing, and among ourselves, the pith of the common rush is used as the wicks of the cottage candles, home made by dipping the peeled rush in tallow.

The BULRUSH (*d*) in the plate, is cut by chair makers to form the seats of chairs, as it is both springy and strong enough to take a good deal of wear, and it is also used by coopers, who put it at the seams of their casks, to fill up the space which they allow for the swelling which is sure to take place when the wood is wetted.

PLANTS XII & XIII. FORAGE.

Green herb not only grows up for the service of men, but it is the provision of great multitudes of cattle; all those ani-

mals which we use either for our food or for carrying burthens live upon grass and the small plants which grow up in the midst of it, and are full of the sweet fresh taste that they love. Foremost among these stand the clover race, with clustered heads of small butterfly shaped blossoms, and leaves divided into small leaflets, sometimes numerous, but more often in threes, the trefoil or shamrock, dear to the Irish in honor of the holy lesson on the great mystery of the Christian Faith, which the Apostle of Ireland, St. Patrick, drew from the three leaves in one.

The RED CLOVER Pl. XII (e) is a handsome plant, with its round head of small purple flowers, and the trefoil leaves, each variegated with white, and bearing the dew so long down among the shade of the rich deep grass that it must be food and drink at once to the grazing cow, and "in clover" is our very proverb for prosperity.

The WHITE or DUTCH CLOVER (c) is smaller, and is more often grown in fields as a principal crop, mixed however with grass, and the tiny YELLOW CLOVER whose sulphur coloured heads and black pods stand at (d). There is hardly a spot of grass to be found without the little trefoils of this pretty plant, and whether rightly or not, the bits of turf given to larks in cages are not thought to be good unless they bear this minute leaf. In hayfields it grows tall, and all the kinds have a very sweet smell, which like that of grass, is more fragrant after they have been cut. What child does not love "the tanned haycock in the mead" and has not happy remembrances of tumbling in the delicious dry grass, or building nests in the haycock. The waggon carries the sweet loads away, and they are built up in tall hayricks for winter use.

The SAINTFOIN (f) a French name meaning holy hay, is very useful as it will grow in poorer land than will good hay grass, and it is much liked by cattle. It is a beautiful flower, growing in spikes, the colour a pale crimson exquisitely striped with deep scarlet, and becoming more purple as the flower fades, so that the top of the spike is often light pink, and the bottom deep purple, and when the wind rushes over a field, it brings out changeable waves of colouring like a shot silk.

LUCERNE, (a) so called from the lake in Switzerland, has a handsome dark purple flower, and is generally grown apart planted in regular lines, and cut down piece by piece, just as it is coming into flower, and given to horses when no sooner has it been mown than it begins to grow again, and the same field may be cut bit by bit, again and again in the course of the summer for many years without being worn out.

VETCHES (b) are another very useful green crop. With handsome flowers growing in pairs, the standard rich crimson and the wings purple, and a graceful tendril hanging from the often divided leaves, ready to bind itself to any support for the weak climbing stem. Though called a tare, it is not the tare meant by the parable of the Enemy coming to sow tares among the wheat. These were a noxious sort of grass, so like wheat that they can hardly be distinguished till the ear is closely examined, whereas the pretty vetch is wholesome to all the animals who eat the leaves, and the black round seeds are excellent food for tame pigeons.

PLATE XIII. gives at fig. b one specimen of the hosts of grasses that rear their graceful heads in summer, and provide their long ribbonlike leaves all the year long for the support of cattle, and the pleasure of our eyes. It would be a dreary world if there were no grass, to gladden our sight by its fresh soft green, or to spread its soft carpet beneath our feet. But more of this when we come to the more important grasses of the next plate, and let us look at the yellow cruciform plant grown for cattle, one of the numerous brethren of the cabbage kind and called RAPE (fig. a). In this you may see the difference between the *legume* or pod of the papilionaceous flower, and the silique of the cruciform blossom. The pod opens all down one side, and has the seeds fastened to each of the valves. While the silique bursts open from the bottom on both sides and discloses seeds fastened to but one of the valves. It is the seed for which rape is cultivated — these little round black grains are full of oil, which is squeezed out of them and made into cakes, used like linseed for fattening cattle, or feeding them in the winter.

It is as winter food for cattle likewise that the great RED BEET c, and the still larger Mangel Wurzel, in English the root of scarcity, are grown. — They are both full of sugar, and very nourishing, and are, like the garden red-beet already described, huge developements of the wild Goosefoot, which is to be met with under every hedge.

PLANTS XIV & XV. GRAINS.

Though the Exogens are the most numerous and perfectly developed of the vegetable world, their threefold brethren are even more important to the human Kind. The Palm tree affords meat, drink, clothing and house room to the inhabitant of the tropics, but a still larger portion of the world depend upon the humbler race of grasses for their food and comfort. To the grass kind we owe our bread, our beer, our sugar, our rice, the thatch of our houses, the food and the bed of our cattle, — nay if all the grasses which clothe our hills and valleys were suddenly taken away, man and beast would both alike be wretched indeed. It is the tribe which above all others seems to have been destined to afford sustenance to such of the creation, as do not live solely on flesh and even flesh is but grass converted into animal substance. A grass is a plant with a fibrous root, often creeping. — Thence there shoot up a few straight, veined, ribbonlike leaves, and hollow cylindrical stems, each terminating in a long sharp leaf — splitting away out from within this first stem, another rises, and hangs out a leaf on the opposite side above the first, there comes a third, and so on till the plant consists of a straight hollow stem, of cases one within the other, and with leaves growing at the joints. From the uppermost springs the blossom, which is composed of two small chaffy scales for the calyx, two again within them often with a bristle at the back, for the corolla, three long stamens with graceful anthers hanging far out, one large germ soft and pulpy, and generally bearing two feathered stigmas. These blossoms are arranged in many varying fashions, sometimes in regular alternate lines like the ray grass, or the wheat, sometimes in nodding plumes, like the graceful brome grasses, sometimes in loose regular panicles like the pretty quiver grass or quakers, on the common. They are almost always green, or whitish, or slightly tinged with brown, and their greatest ornament is the elegant form of the anthers, which hang out on their slender filaments far beyond the corolla. The profusion of green leaves rising from the root, and sprouting the more plentifully the more they are cut, eaten, or trodden down is the ornament of our turf, the refreshment of our eyes, and the food of all the multitudes of grass eating cattle. The stems and leaves are very tough, full of particles of silice, or flint, and therefore very sharp, a cut on the finger with a grass leaf is very painful, as most of us have felt, but they are likewise very lasting. The largest of all grasses, the Bamboo, 30 or 40 feet high, furnishes pipes fit for the conveyance of water. Flutes and other musical instruments are made of the hollow stems of canes and other grasses; and nearer home, straw serves for the roofing of our houses, and when split and plaited makes the most lasting hats and bonnets. Moreover these valuable grass stems contain a sweet juice which flows out when they are wounded, and which may be tasted by sucking the joints even of our own small English grasses, — but which flows out in far larger quantities in the canes of the East and West Indies, and when boiled and purified becomes sugar. But our present concern is with the seeds of grasses, and with the various uses to which they are applied. In all grasses the pulpy germ hardens into a solid seed, the grains of various kinds which serve many birds for food, and which in the larger sorts are the very staff of life to man. Every one who has read the traveller's wonders in "Evenings at Home" must remember the drink made from grass seeds that so much puzzled the young party. And to make this drink is the chief mission of the brave JOHN BARLEYCORN who stands first in the plate, with all his pointed spears (a), namely the elongated bristles of his corolla. Grandly they stand out from the four rows of blossoms, and beautifully silvery do they make a barley field nearly ripe, when the

sun shines on it, and the gentle summer wind sweeps over it in ripples of light. Much Barley grain is used for the feeding of poultry and fattening of pigs, and bread is sometimes made of it, but the chief use is in making beer. The grain is moistened, and spread on the floor in a dark room, that it may heat, and begin to grow, but just as the seed has swollen and is about to burst, it is laid down on the brick floor of a kiln, and the growth is stopped. It is now called malt, and has a sweet taste, and is handed over to the Brewer, who boils it several times with hops, and leaving it to ferment converts it into Beer, Ale or Porter, the strengthening drink of the inhabitants of Northern Europe, a great blessing when not used to excess. The BERE or BIGG (*b*), is barley of six rows of blossoms, not so good, but ripening faster, and therefore grown where the summer is too short to ripen the superior grains.

RYE (*c*) will likewise grow in poor land, and in cold climates, and it is therefore cultivated a good deal in Northern Europe, furnishing bread to the inhabitants of Sweden and Norway, and growing the most northerly of all grains. No one knows when or where any of these grains were wild, they seem, like oxen and sheep, to have been attached to the use of man from the time of the flood, and not to have been discovered and applied to his service like a new invention.

This is especially the case with WHEAT (*d*) and (*e*), the grain which above all others serves for the support of man, in so much that ears of wheat are the very token of fertility and prosperity. There are several different kinds of wheat, some with long beards like barley, some with more or fewer rows of blossoms and grains in the ear, but all with the pendant anthers, and large solid grain. The wheat of ancient Egypt had ears spreading like fingers from a hand, five, seven, or nine ears arising from one stalk. Corn which had been laid up for three thousand years in the case of a Mummy, has on being sown actually grown, and produced these spreading spikes, just such as Pharaoh dreamt of, but the wheat which is chiefly grown in Europe, bears a single ear on each stalk, with usually about five rows of grains, and from eight to fifteen grains in each row, about five or six stems arising from each root, and thus each seed sown affording a most bounteous increase, sufficient not only to afford seed to the sower, but bread to the eater, enough and to spare.

"The bare dead grain in Autumn sown,
Its robe of vernal green puts on;
Glad from its wintry grave it springs,
Fresh garnished by the King of Kings,
So, Lord, to those that sleep in Thee
Shall new and glorious bodies be. —

Wheat is a hardy plant, and is usually sown late in the year.

The bare dull grain of autumn does indeed arise beautiful from the furrow, for nothing can be more exquisite than the colour of young wheat in the early spring, when the frosts and snows begin to pass away, and the slender flags or leaves have freely mantled over the dark soil that nourishes them. By June they have raised their stems, sheath within sheath, and the tall ears are rising, adorned with their nodding anthers like pendant jewels; in another month, the jewels have fallen, but the pulpy seed is hardening, and a strange pale gold is beginning to tint the fields as they become "white to the harvest". The Hill sides glow with the bright and ruddy amber of the red wheat, and the paler buff of barley — and then the reapers come forth with their reaping hooks, men, women, and children together, they gather the clusters of rich brown ears, cut them down at the roots, and bind them into those noble and beautiful things, wheat sheaves, that seem the visible emblems of the good Providence that feeds us. By and by when the sheaves have stood long enough to be thoroughly dried, the heavy harvest waggon comes creaking slowly through the stubble, and the sheaves are tossed into it, till the waggon has been loaded again and again, and at the last, the horses and the topmost sheaf are crowned with green boughs, and the reapers burst out into loud and merry shouts at their harvest home, which generally ends with a happy harvest supper. Then come the Gleaners, old and young, trooping into the field, to gather the ears that are left, even as the

Law of Moses commanded that the scattered spikes should be left for the poor, the fatherless and the widow, that so the Lord might give His blessing. After harvest, the grains are separated from the ears by means of threshing, which used to be done in the Holy Land by driving Oxen over the wheat to tread it out with their feet. — In our country, a man stood on the barn floor with a flail, two heavy sticks fastened together by a leathern thong, with which he thumped the grains out, and they were afterwards cleared of the chaff, or dried corolla and calyx, by turning a winnowing machine made of fans of canvass upon a frame; but these processes have been much disused of late, since small steam engines have been invented which thrash and winnow at the same time, and may be heard humming, fuming and panting beside the fast disappearing wheat stacks in the Autumn. The corn thus cleared, is sent to the mill, where it is crushed between two heavy stones. The outer case of the grain is hard and dry, and is sifted away from the rest and sold separately as bran, for the feeding of pigs. Within is the white soft substance, consisting of starch and albumen, which is called flour, and is handed over to the Baker to be made into bread; that article of food which may well be called the staff of life, since there is scarcely any other on which it is possible to live so long or so exclusively. All the other grains contain more or less of these substances, starch and albumen, but none are so nourishing as is the flour of wheat, and it is grown throughout the Temperate Zone, wherever the soil is good enough to support it.

OATS (*e*) have a graceful loose nodding spike, with their blossoms separate, larger than those of wheat or barley, their grains of a shuttle shape, and sometimes black and polished, though more often white. Their native home is said to be the Caucasus, but they have always been under cultivation, and have been much used for food. In Scotland, oatcake is a favourite article of diet, and both in Scotland and Ireland, oaten flour stirred over a fire with a stick, with a little water, is much eaten under the name of porridge or stir about. In England oats are the chief food of horses, and the chaff of oats is used for stuffing the mattresses of the poor. The ancients seem to have made musical instruments of oaten straw, and their latin name AVENA is likewise the name of a pipe.

PLATE XV.

The MAIZE (*a*), is the largest and handsomest of all the grains. The plant is sometimes six or eight feet high, with immense flag like leaves, tinted with a ruddy colour. The blossoms have the stamens and pistils separate. The barren flowers grow in a large spike, bearing two rows of alternate blossoms, with pendant anthers, the fertile ones are in large sheaths, at the joints of the stem. These sheaths entirely conceal and guard the long soft pale green head, and the pollen could hardly reach it, but for the profusion of long green hair-like styles "the long and glossy plumage" which are hung out from the sheath to catch the pollen. This done, these styles wither into brown or red strings, while the germs beneath harden into beautiful round golden grains as large as peas, ranged in rows along the receptacle, while the spathe dying away, displays the rich looking treasure. Maize was the corn of America before it was discovered by Europeans, and the name of Indian corn is therefore given to it, though it is also called on the Continent Turkish wheat, and by the Germans Italian wheat because they first received it from Italy. It is a favorite crop in north America, where the cobs are eaten green and considered excellent, and cakes and puddings of many kinds are made with the meal, but the bread is not so good or nourishing as wheaten bread; and though the meal has now and then been imported in time of scarcity, and the plant will easily grow in our climate, it is seldom cultivated here except as an ornament.

— "in all the splendour
Of its garments green and yellow
Of its tassels and its plumage
And the Maize ears full and bursting
Gleamed from bursting sheaves of verdure."

RICE (*b*) is the grain of those parts of the world which are too hot for wheat. It grows in a loose panicle, and the grains are very hard and white, less nourishing than those of the other species of corn, but almost the sole subsistence of the native inhabitants of the East Indies, who need less solid food than the people of colder countries. It is grown in fields close to the river side, which can be easily irrigated, water is let in so as to stand over the whole soil, even while it is being sown, and horses and oxen are driven in to tread it into the ground. In India, these wet fields are called paddy fields, and are the most important crop. In China likewise, much rice is grown, and is not only used for food, but after much boiling and cooling it hardens into a substance almost like marble, of which many ornaments are made, and it is also spread into rice paper, which takes colouring most beautifully and softly. A great quantity of rice is brought to England to be used for puddings and in broth, but this is chiefly brought from Carolina in North America, a country so low, wet and hot, in the swamps of the great rivers, that though not native there, the rice grows larger than even in India, which would seem to be its original home.

MILLET (*c*) is another sort of grain, chiefly cultivated in Southern Europe, Northern Africa, and Eastern Asia where a fermented drink called *teff*, or *murwa*, is prepared from it, which is drunk warm and weak, through a reed, and is said to be very unpleasant to European tastes. Some kinds of millet are used for food in Brittany, and others in Northern Italy, but we seldom see them here.

PLATES XVI TO XXVI. POISONOUS PLANTS.

The same bounteous Hand which has prepared the grass and the Herb for our food, has also fitted the vegetable world to supply us with medicine, but those plants which are healing to the sick often have deadly effect on those who have no disease to be counteracted. They are therefore classed under the head of poisons and are to be carefully avoided as food, though the beauty and grace of many of them have caused them to be looked on as the emblems of temptation, at first alluring, then leading to death.

One of the most notable among these medicinal plants is the beautiful **FOXGLOVE** (Pl. XVI *b*) or *Digitalis*. It is a biennial plant, that is, it flowers and dies the second year after it has been sown. The leaves are large and downy, the stem solid and straight, bearing a long spike of bell shaped blossoms, the lowermost of which open first, so that it tapers towards the top, and they hang all on the same side of the stem. They are of the large class of Labiate flowers, like the Lavender, but unlike its four naked seeds, the germ becomes a hard-shelled brown capsule as does that of the snap dragon, the skull cap and many others, which unlike the bare-seeded ones, either have no smell or are unwholesome and disagreeable.

Nothing can be more noble and beautiful than a full richly belled foxglove spike, which could never come into our pictures for it rises up two or three feet, and hangs down double and treble rows of the bright beautiful flowers, of a deep red polished purple outside, and inside white, hairy, and speckled with dark brown spots and rings. The stamens have bent filaments, adhering closely to the upper side of the flower, and the outside of the anthers before they have opened to discharge their pollen, is bright yellow, spotted with tiny brown specks.

The multitudes in which foxgloves grow is another great charm of the woods and hedgerows in late July and early August; they are quite purple with their grand nodding spires, and gather and gather as children may, they can hardly exhaust them. Children like to hold both ends of the flower, shut in the air, and then snap them together with a loud pop, so that the autumn road is often strewn with the pretty purple bells — or some merry children will thrust their fingers into the long blossom and hold them up, as if they had on crimson gloves, not knowing that this is the very reason of their name both Latin and English, for *digitalis* means something belonging to a finger, and the foxglove, ought to be folksglove, the folk being the

good people or fairies, who used in England to be said to use them for their gloves, or the lesser ones, to hide in their bells. In Ireland this flower is called the Lusmore or fairy-cap, and in truth the bell would suit a little fairy head quite as well. Leaving fairies and their pretty tales however, it seems that the *Digitalis* or foxglove juice has a great effect on the movement of the heart, and the circulation of the blood, so that though beneficial in some illnesses, it would be very dangerous to a healthy person.

If it be a disappointment to find the glorious foxglove classed among poisons, what is it to discover the golden **BUTTERCUP** (Pl. XVI *b*) or king cup, that early spring friend, among the same class? It is well that we do not to eat all that we admire for the buttercup or ranunculus is full of an acrid blistering juice, so that even the cow have instinct to refuse it, and will leave the bare stalks standing up, when all the grass between them is gone. It belongs to the same natural order as the poppy, and every one of them is more or less poisonous. This noxious family may be always known by one certain sign, namely that the calyx is not fastened to the carpel, but the numerous stamens are. The apple and most of our fruits are many stamened, but then they have a firm, permanent calyx, which lasts even longer than the fruit, but the poppy, the ranunculus, the anemone, and many others have a small feeble calyx, which falls off sometimes even before the blossom opens, and all of these are unwholesome. The ranunculus, crowfoot or buttercup, for it is a plant of many names, has a low branched stem, shining leaves, and five most brilliantly polished yellow petals, containing a host of stamens, and a knob of curiously shaped carpels, something like commas upside down.

There are many sorts, the grand crimson garden ranunculus that first came from Egypt, the merry little spring celandine or pilewort, with stem unbranched, and the petals double the usual five number, and very narrow, for convenience of shutting up readily.

There is a flower, the lesser celandine
That shrinks like many more from cold or rain.
And the first moment that the sun may shine
"Bright as the sun himself, tis out again."

Besides these are the merry kingcups, laughing in the meadows, the small pale corn crowfoot, with the curious seed-vessels in the wheat fields the two white water crowfoots, with yellow eyes, that smile upon pools and rivers — one with ivy like leaves to keep it afloat on the surface of the stream, and short tassels of dark green beneath, the other growing under water, in immense plants, lying along under water, waving their green hair like foliage with the motion of the stream, and curiously twisting or stretching the stalks so as always to keep the flower above water.

These pretty plants all have the same acrid juice, and are seldom used for any purpose of man.

The larger **CELANDINE** Pl. XXII, fig. *a*, is like a little yellow poppy, the yellow petals so loosely attached that they are shaken off by a touch, but looking very pretty on a shady bank among their profusion of pale grey leaves.

The acrid juice is sometimes used for removing white spots from the eye.

PLATE XVII. — Any one would think the plant first standing here was the pretty purple crocus, whose ornamental stigma is called saffron, colours cakes, and is used for medicine for sick canary birds. But this meadow saffron is no such thing, it has six stamens instead of three, and flowers, not in early spring, but late in Autumn, when it would have no chance of ripening the seed, if it did not keep it within the leaves safe under ground, all the winter, and put it up with the leaves in the spring — as if by way of being unlike all other plants. The blossom though it appears both leafless and stemless, is a great ornament to the meadows in the midland counties, but the people round seldom gather it, as it is full of poison. — The bulb however is taken up to be used as medicine, under the Latin name *Colchicum*; for it is found very useful for the cure of gout and rheumatism.

The pretty red berries of the **MEZEREON**, have even in the picture a treacherous look, and yet the plant is a great friend, for the dark purple flowers, on the leafless shrubby stems, are some of the firstlings of the year. Here and

there, it is found wild in England, but it is almost certain to be in gardens, putting forth in early spring the four petalled, eight stamened, one pistilled flowers, and in Autumn the dark laurel-like leaves and red berries, which if eaten by us would blister the mouth and throat by their acrid juice, and yet are a favorite food for robins and other little birds in the winter. It might not however be safe for us to eat the birds afterwards, nor honey made from the blossoms. It is said that many of the Ten thousand Greeks, in their retreat, were seriously ill from partaking of honey made by the Bees of the Caucasus, where the Mezeron grows in great quantities.

Our name for it is said to be Persian, the French call it *BOIS gentil*, or pretty wood, and the Italians *laureola femina* — the lady laurel.

THE SPURGE LAUREL (Pl. XXIV) — is very like the Mezeron, and has many of the same qualities. — It is equally rare in England.

PLATE XVIII. — What country child has not wandered by the hedge in pursuit of crimson Lords, or fair white Ladies, rolled up in their green mantles, or sitting within their hoods displayed, like sea nymphs in a picture under their fluttering garments? and what child has not in Autumn been warned against touching the bead like scarlet berries that cluster round the short stem, and well that it should be warned, for these shiny fruits are highly acrid and blistering, and yet the *ARUM* is a plant that might figure among wholesome friends quite as suitably as among the poisons. It has a tuber or round root like the crocus or colchicum, which is full of starch, and free from poison, and it is this which ground up, baked and boiled becomes the white powder called *Arum root* or *Arrow root*. Some is made even from our common wild cuckoo-pint or lords and ladies, especially in the Isle of Portland, whence it is called *Portland Sago*, but most of what we use is from a large plant which grows in the West Indies.

The *Arum* root sends up a number of footstalks bearing handsome heart shaped leaves, often spotted with black, and one large pointed green spathe, which unrolling gradually, discloses the tall red or white fleshy column, a sort of stem, bearing around the base a ring of white hairlike stamens, and beneath them again the carpels, like a string of crimson beads, which in time becomes the scarlet berries that alone remain in the Autumn when the curious and beautiful blossom has passed away. Perhaps no plant is more curiously divided between food and poison than are the *Arum* kind. Some foreign sorts, in especial the *Zebra*, a jet black column, with a striped spathe, have a most horrible smell. — One kind smells so like carrion as even to deceive the fleshflies, which lay their eggs in it, thinking it will provide food for their grubs, and there is even heat to add to the delusion, for the warmth within the spathe has been proved by the thermometer to be greater than that of the air without. They grow to a very large size in hot countries, and their tubers are eaten under the name of *Yams* and *Cocoa bread*.

It is for its sleepy or narcotic qualities that the next plant figures among the poisons, the *HERB PARIS*, a plant not very commonly wild, but welcome when it is found for the curious regularity of the growth, the leaves all springing together four in number, the calyx in four sepals, the corolla in four petals, the stamens twice four, the pistils four, the berry four cleft. The leaves are very dark, the calyx and corolla pale green, the berry dark purple, and the whole plant somewhat obscure and gloomy.

Gloom is the character usually given to the Tree next ensuing, the *YEW* pl. XIX (fig. a), though the delicate spray here pictured with the brilliant berries has any thing but a dismal appearance.

The evergreen is indeed very dark and solid, but it was first planted in churchyards, not for the sake of its grave colouring, but for the sake of the hard wood, which was the best material for the long bows of the English Archers. — The "tough yew bow" was such an admirable weapon that not an English peasant was allowed to be without one in early times, meetings were held for practice with them, and many a time they won the day in battle. Yews are very long lived

trees, and a great many are still living which were planted even in the time of bows and arrows, and some old patriarchs are known to be at least 800 years of age. It is said to grow for 100 years, and then to stop, and although the centre in lapse of time decays, there is such a quantity of new wood constantly forming that it almost seems as if time could not kill it.

The dark masses of foliage look beautiful among the lighter trees in the hedges, and many a churchyard is ornamented with a yew clipped into the shape of a Mushroom. — Indeed in the time of Queen Anne, it was the fashion to clip yew bushes into the most fantastic shapes, peacocks, lions, balls, towers, arches, and a tree is still standing at Arlington near Hounslow which used to be clipped into a pyramid, standing on a canopy and bearing a Globe, on which stood a weathercock eighty feet above the ground. The leaves of the yew tree are very narrow; dark green and silvery below, the stamens and pistils grow on separate trees, so that there are some that never bear fruit. — They however bear little circular catkins, covered with buff coloured pollen from the eight or ten stamens, and are seldom far distant from the fertile trees, which have tiny green cups inclosing a hard green germ, something like a little model of an acorn in a cup. but as the summer goes on, the green cup softens, enlarges and turns red, while the seed within sinks deeper down within it, and at last when ripe, the fruit is a bright waxy looking red vase, of a very soft shiny texture, with a jet black nut looking up from within it, very beautiful in the contrast with the dark foliage, over which it is profusely scattered. Though the red cup has a disagreeable mawkish sweet taste, village boys nevertheless will often eat it, and this portion of the fruit seems to do them no harm, but the black nut is certainly poisonous, and children have sometimes been killed who have been so foolish as to eat them. The leaves are full of narcotic poison, and are especially dangerous when just beginning to wither. Cattle have often died of eating the half faded young shoots thrown to them with their litter, and one poor foolish woman actually caused the death of her three little children by giving them boiled Yew leaves, which some ignorant person had recommended to her as medicine.

Among the five stamened, one pistilled flowers, there is a numerous division all of which have poisonous qualities and some to a most deadly extent. These may be known from all the innocent five stamened race by their having a round carpel growing above the corolla, and the leaves growing alternately on the stem, and they generally are of dark lurid colours, although some are extremely beautiful, such for instance as the *HENBANE* (b), a handsome flower, of a pale cream colour, shaded, with purple towards the centre, and covered with a net work of purple veins. It has a very unpleasant odour, something like *laudanum*, and is soft, downy, and sticky to the touch. It grows in waste places, such as road sides and village greens, but is not very common. It is useful in medicine as an opiate, and is often given under the Latin name, *hyoscyamus*, to quiet a cough.

THE THORN APPLE (fig. a) pl. XX, has a blossom like that of a convolvulus, white, shaded with purple, and a fruit consisting of a thorny husk full of seeds. — It is very handsome, and is often found on heaps of waste earth thrown out from gardens. It has the same lulling qualities and is sometimes used in medicine. It is a near relation to Tobacco, which is one of the plants of this class, and is unfortunately the article most consumed throughout the globe.

The most fatal of all this class is however **THE DEADLY NIGHTSHADE** or *Atropa*, so named from the Fate of Greek fable, whose office it was to cut off the thread of life with her shears. — *Belladonna*, or fair lady, the other name, seems to have been given as if to shew that "pleasan tsins", as they appear at first, lead to destruction, for the plant is not a fair one, in spite of its tall luxuriant growth, and purple veined bells. It has strongly the air of poison, and the shining black berries look as if they were fraught with death. It is not often found wild, having perhaps been rooted out, lest children should be foolish enough to eat of them. — The effect of them is either sleep, or else a strange and miserable waking

trance. There is a story of a Tailor who for fifteen hours could not speak, and knew nothing of what went on round him, though he moved his lips, and sewed with his fingers. It is said that a whole army of the Danes were once poisoned by the Scots with an infusion of the deadly night shade. It has the strange power of enlarging the pupil of the eye, when applied externally.

"The herb that expands man's eye to the light,
The fair lady who leads to the shades of night."

Is of the same genus as the mandrake which grows more to the south, and used to be supposed to scream when it was pulled up from the ground.

There is more to be said in favour of the *Solanum* tribe, — our own two native sorts, the bitter sweet or **WOODY NIGHT SHADE** (Pl. XXI), with purple flowers and red berries and the **GARDEN NIGHTSHADE** (Pl. XXII) with white flowers and purple berries are indeed very poisonous, but this genus likewise includes the potato, and the capsicum, the love apple, and other plants that are often eaten in other countries though some portions of them all are noxious.

On the whole, a long acquaintance is needed before any one can venture to meddle with any of these plants of the rule of five, with the superior germ, and alternate leaves.

The race with many stamens growing on the germ are not more to be trusted, and here is one of them, pl. XXI (fig. a) called the **MONKSHOOD**, for the sake of the upper leaf of the calyx which is purple, and folded over the two upper petals just like a little cowl, under which the green germ peeps. — It is a handsome plant, often found in gardens, but full of acrid poison, raising blisters if the juice touches a wound in the skin, and bringing on sleep if taken inwardly.

Next follow the umbellate flowers, the evil brethren of our wholesome garden plants of this order, each of which seems to have a wild, noxious unreclaimed likeness — the first is **FOOLS PARSLEY**, XXII b, which has pretty delicate leaves more graceful than the garden kind, but without the pleasant smell, and though no one would wish to eat it, not likely to cause much mischief. The wild parsnip, carrot and celery, and the fool's water cress are much more dangerous. Hemlocks in South America furnish food, but we have none but a very mischievous sort, the tall wild **HEMLOCK**, XXIII a, a large handsome plant, with a round hollow stem, thickly spotted with purple, and leaves whose footstalks begin by embracing the stem, and are like it spotted. The leaves are deep green and shining, the capsules ridged —

"Do not chew the hemlock rank
Growing on the weedy bank"

has always been the advice of the nursery rhyme to the cow, who needs it very little, for the taste of the leaves is quite enough to prevent cow or man from eating them, although little boys do contrive to make a musical instrument of the hollow stem, quite capable of emitting frightful sounds.

PLATE XXIV. THE WATER HEMLOCK or cow bane is fortunately not very common, for it is deadly poison to cows, although horses and pigs seem to be able to eat it with safety. It is a more slender plant than the common hemlock, and generally grows in marshy pools. The root is curiously divided by bars with a hollow space between them.

THE DROPWORTS (c) and (d) are some of the most noxious of the umbellate flowers — water always seems to be food for poison in this race, and these are most dangerous plants. Some years since 17 convicts at Woolwich dug up and ate the roots of one of the dropworts, four died, and all the rest suffered considerably. They are large handsome plants, with graceful leaves and long styles, which hang on even after the fruit is ripe and give an ornamental appearance.

The **SPURGE** kind are exceedingly strange flowers, of which we have many wild sorts, as little specimens of the extraordinary forms which they present in tropical countries.

Their flowers are in heads, one large bare fertile flower divided into three, standing up in the middle, and a number of small barren flowers, each with a single stamen standing on little stems round it all in one involucre, and quite green, all but the anthers, which in some kinds are moon shaped. Some foreign sorts are woody, and covered

with thorns, others are herbaceous, but all possess a quantity of milky juice that gushes out wherever the plant is wounded, and is very acrid. It is the hardened milk of the great caoutchouc spurge which affords us that material put to so many strange uses. — Indian rubber, but our present concern is with a plant often found in gardens and sometimes wild, and very curious it is, with its straight stem, and pairs of pointed opposite green leaves, growing so regularly, and the branching head bearing the involucre of two opposite leaves, and the great threefold carpel, with a seed in each division — every morsel of it when gathered teeming with drops of white milk, looking tempting but which would instantly blister any sore on the skin. It is called in Cottage gardens, Jacob's ladder, from its regular growth — in America it is known as Moleplant, because it is said that Moles never burrow where it grows, and in other places it is called caper spurge, because the germs after long soaking in salt and water, and vinegar to destroy the acidity, are often pickled and used as capers. So by going through the poisonous races we find that even the plants full of deadly juice are not to be looked on merely as enemies, but more as friends who may help us in time of need, though they may not be lightly applied to. So true it is that nothing has been made in vain. Some of the brightest freshest green we see in the spring in copses and by hedge sides is furnished by the **HERB MERCURY**, with its polished leaves, and spikes of green flowers. The plants are barren and fertile, the first having green three-parted corollas, containing from nine to twelve stamens, the fertile ones a rough two lobed germ, supporting two styles. They grow up from a creeping root, in great profusion and have a friendly spring like look, but they are dangerous to sheep, and it is said that a whole family were poisoned by eating some fried with bacon.

A little later in the year when all the flowering trees burst out in a flush of gay colouring, no bloom is more sunshiny than the pale golden tresses of the **LABURNUM** (**PLATE XXV c**), drooping in a profusion of graceful streamers, seeming to smile with light, and forming a most glorious network under which to stand and look up into the deep blue sky of early summer. Golden chains is the peasant's name for it, and it is a great pity it is not usually so called, for the word Laburnum is only a corruption of **L'AUBOURS**, or **L'ARC BOIS**, bowwood, as it is called by the peasants of Switzerland and Dauphiné. — The wood is almost as good for bows as the yew, for it is very hard and elastic, light coloured outside but very dark near the heart, and it is much used for inlaying and ornamental work.

The flowers are of the papilionaceous or butterfly form, with a beautiful little dark brown pattern on the standard, the leaves are trefoils, the seeds grow in pods, and are very black and hard. If eaten they cause violent sickness, and it is said that Bees will not settle on the flowers, but hares and rabbits have unfortunately no such objection to the bark, nor snails to the leaves, and amongst all these enemies, the poor young laburnum is apt to be killed by the loss either of its coat or of its lungs. — But the seeds grow so easily on falling into the ground that there is little danger that we shall ever be without the glory of our Laburnum bowers. It is native to southern Europe where the Italians call it **Maggio** or **May** as we do the Hawthorn, but it is very hardy and can be cultivated far to the North.

It is not at all common with the Butterfly race of flowers to be unwholesome, but this pretty **YELLOW VETCHLING** (b), and indeed all the *Lathyrus* race must be convicted of having seeds unwholesome to man, and likely to cause violent headache and sickness if eaten. The herbage is however not injurious to cattle, and few of our wild plants are so beautiful as the little crimson vetchling, or the deep purple vetchling that climbs up by its long tendrils, and forms bowers with purple and green canopies where we might fancy the fairy Queen holding her court.

No one would wish for prettier bowers than those formed by the Bryony or Wild vine, white and black (**PLATE XXVI**) not that they are at all nearly related. — You may know them even when they are out of blossom by the smooth glazed heart shaped leaves of the **BLACK BRYONY** (b),

and the rough vine leaves of the WHITE (*a*), and its lovely corkscrew tendrils, laying so deftly hold of every bough year by year. — Besides, the blossoms of the black bryony are little green stars, six stamens on some plants, three pistils in the others — while the white bryony has much larger and paler flowers, light green veined with darker. The stamen-bearing flowers are the largest, and each contain two pairs of stamens and one odd one, the fertile flowers are on separate plants with three yellow styles. The berries of the black bryony are purple, those of the white are red. Both have large tuberous roots, and die down to the ground every winter, shooting up again in the spring, and winding themselves gracefully over all the adjoining bushes. They are both very acrid and poisonous, so much so that the root of the black was in former times crushed and used for a blister.

The white bryony root was sometimes cut into a shape like a man's figure, and called a mandrake; but it is now seldom used except by old women, who consider it a cure for black eyes. Discoveries in medicine have put a stop to the curious practice of country herbalists, and these plants are chiefly esteemed as the graceful climbing ornaments of our woods in summer and early Autumn.

PLATE XXVII. — FUNGI.

The Fungus tribe belong to the great race with secret fructification and only powerful microscopes and close observation have brought any thing to light as to their parts. It would seem that they, like lichens and mosses have invisible seeds, in almost invisible purses, which purses are always under a fleshy cap, that grows up from a strange cobwebby matter, and expands into different forms — more as it would appear according to the condition of the air, light and heat around than according to the nature of the parent plant. The handsomest and most developed of the fungus tribe are the AGARICS — the MUSHROOMS or TOADSTOOLS. — They spring up from a cobwebby substance, raising at first a little round knob, within which the stalk is gradually formed. By and by, the outer skin bursts, and leaves a fleshy stem supporting an equally fleshy cap, which gradually enlarging, tears the lower skin which united it to the column, and opens like an umbrella, or like a round table, flat and smooth above, and beneath divided into a number of rays or gills diverging from the central column and containing between them the purses of seeds. These Agarics come up in great quantities, and very suddenly wherever they find sufficient damp and heat, and they fertilize the grass so much as to mark the turf with the greener rings of verdure where the fairies were thought to dance nightly — and the round heads of the Agarics were pretty tables for their midnight revelry, well fitted for their acorn cups of dew. The Agarics are sometimes wholesome, sometimes fatally mischievous, but much depends upon the climate and conditions of their growth, so that what can safely be eaten in one country are dangerous in another.

The only one regarded with much favour in England is the common MUSHROOM (fig. *a*) or champignon, a very pretty plant, white above and the gills rosecoloured, turning brown or purple as it grows older. Damp and heat are pretty certain to bring it up on any down or pasture where there has been tolerable manure — first the little white buttons, and then the soft graceful head, so bright and fresh looking and full of delicious and peculiar scent. It is a pleasant thing to fill a basket with mushrooms, and as long as the gills are pink, and the odour right, there is little danger of a blunder. — Sometimes indeed under trees or in the borders of fields, there is found an immense mushroom, with gills more lightly coloured, and inclined to turn black, called by Botanists AGARICUS GEORGII, and by cooks, horse mushroom, and much despised by the latter, but there is no harm in them, they only have not so good a flavour, and they may safely be made into catsup.

The Beautiful FLY AGARIC (*f*) with its crimson cap, dotted with white, and its snowy gills, has all the brilliance of a beast of prey, and rightly so, for it is full of poison and has been the death of many who have been foolish enough to eat it. In Kamschatka, it is dried and swallowed

whole, when it produces a state like that caused by opium, and it also is used to make an intoxicating liquor mixed with the juice of the vaccinium. But in the pine woods of England and Scotland, where it raises its crimson head, we are content to admire its gorgeous beauty in the sunshine, and regard it as the throne of state of some imperial toad, if such there be.

The Modest CHANTARELLE (*b*) grows in a vase like form, the cap hollowed inwardly, and sometimes scalloped at the edge. It is buff yellow, and grows in mountainous woods, on the Continent where it is much prized. — And so much gathered that the Germans have 24 different names for it, and the French 14, while here in England people are afraid of it, and have scarcely one name for it, except that in some counties it is said to be called pixie stool, from the pixies or fairies who were thought to delight in its haunts. It is said that when dried the sauce is like ripe apricots.

THE MORELL (*c*) has a round head, with cells instead of gills, and grows in sandy places, near streams, and especially where fires have been. — Indeed at one time, the German peasantry would burn their woods to make the morells come up, but as this plan was rather like that of burning a farm to roast a sucking pig, the practice was forbidden by law. The truffle which grows under ground and is scented out by dogs or pigs is the only other fungus often eaten. — It is one of those which carry on their fructification within their fleshy cases, and of which there are far too many to describe. There is the great white puff ball, full of powder, and dried for the purpose of being burnt that the vapour may stifle wasps or bees. There are also many other curious sorts, of which the rarest and prettiest is the GEASTER or EARTH STAR (*d*), which grows underground, until nearly ripe, when the round head pushes above ground, opens in the middle, and shews a fringe of short threads rising upwards like a crown, between which the seeds escape. The star which was the outer case of this globe, lies back on the ground divided into regular segments, most beautiful in its symmetry.

If shape is the beauty of the Geaster, colour is the glory of the PEZIZA, or fairy bath, the beautiful little scarlet cup that grows up on dead sticks by damp hedge sides in the winter. That in the plate (*e*), is a giant, they are seldom nearly as large as an acorn cup, but the crimson velvet of the lining is beyond measure exquisite, and contrasts with the furry pink outside, and the dark rotten stick on which grows this bright little winter jewel.

The flat horned SPHERIA (*g*) is a grey branched fungus to be found on dead sticks and stumps doing its work of fertilizing for better things. — Its fructification may be seen by cutting the mottled part through with a sharp knife, when a microscope will shew the little black seed purses, each furnished with a pore to let out the seeds.

PLATE XXVIII. — FRUITS.

It is a sudden change to make from poisons to fruits, from medicine to enjoyment, but both are alike prepared for us by our merciful Father who made every plant whose seed is in itself, and every herb of the field before it grew. Fruits are really an enlargement of the germ or receptacle which becomes fleshy or pulpy and is filled with water, sugar, albumen, and acid, which are, if left to themselves intended to serve for the nourishment of the seeds. But the seeds will usually grow without this fleshy case, and such creatures as eat the fruit usually throw away the seed, so that it has a chance of growing, and besides it has been bounteously appointed that all these fruits should be produced in far greater quantities than are needed to keep up the stock.

The first here drawn belong to a race not native to England, the Gourd or pumpkin kind. These are Annual plants, with a weak trailing stem, provided with long corkscrew tendrils by which to take fast hold of any support, large pinnate leaves, shaped like those of the hop or vine, yellow blossoms of one petal, some containig five handsome stamens, others a large button-like stigma, and beneath (not above like the poisons) a large swelling germ, which germ most rapidly swells into a large fruit, with a stout rind outside, and a quantity of soft

watery flesh containing in the centre a sort of network filled with flat seeds. The plants grow and enlarge in a marvellously short time under a hot sun, and when trained over a frame, their noble leaves form a most delightful shelter from the sun, so that we can well understand how Jonah enjoyed the protection of his Gourd and mourned for the loss of it. The cool wateriness of the fruit likewise renders it most refreshing in hot countries, and in Italy, huge slices of the water melon, form the chief food of some of the poor in summer. The Arabs live much upon melons, and grow pumpkins for feeding their cattle — and a pumpkin pie is the favorite national dish in the United States — in fact wherever the sun is hot, this reservoir of cool fresh watery pulp is sure to be found springing up abundantly. — The hard rind is also very useful, it often grows much larger than a man's head, and when the inside has been scarped out, it is filled with sand and left to harden in the sun, when it becomes a useful vessel, capable of containing water, and called a calabash. Our summer is not long enough for the growth of these plants without the help of a hot bed, where the young plants may be sheltered from the early frosts, but by this means we are enabled to raise vegetable marrows for eating boiled with meat. CUCUMBERS, Plate XXVIII (a), which are of a curious lengthened form, and covered with rows of prickles when young, though these smooth down as the fruit ripens and turns yellow. — Our use for them is long before this however, we eat them just before the seeds begin to form hard and crisp, and dividing them into thin slices, eat them with pepper and vinegar. As soon as the seed is formed the fruit becomes bitter.

The MELON (b) is even tenderer than the cucumber and requires very careful attendance.

It is full of pale green or salmon coloured flesh, most delicious to the taste, but of which a large quantity is injurious in our cold climates, though it is so great a delight and blessing to those who live in the hotter countries where it has been placed by providence.

The fruits of hot countries are for the most part very insipid and tasteless, as the sun would ferment any acid which they contained, unless they had a very strong double coat, such as that of the orange. Therefore it is only in the temperate zones that the pleasant, delicately flavoured, slightly acid fruits belong, and these in great measure belong to the same class as the rose. They have many stamens, many styles, five loosely fastened petals, five calyx leaves, solidly attached to the receptacle, not falling off, like those of the poisonous poppy race, but lasting as long as the fruit holds together.

The STRAWBERRY (Plate XXIX a), is the best, as it is the hardiest. The mountain side, where it is covered with snow in the winter is its favorite place, and there it climbs with its multitudinous runners, that root themselves wherever they can find soil, and put out their jagged trefoil leaves, and small white blossoms, containing a round germ, bristling with styles. As the blossom falls off this germ becomes a fleshy crimson fruit, bearing the little seeds outside it. The woodside, the moorland bank, the edges of the mountain torrent all bear their delicious fruit, and many and many a child remembers the delight of gathering the wild strawberry, as it hangs in red clusters on the stem, bearing fruit and flowers both at once. The care of Gardeners has enlarged the strawberry considerably, but nothing has ever been able to make even the delicious red berry of our Gardens equal in flavour to the strawberry of the Alpine hills or the Norwegian valley; a thorough child of the mountain, it flourishes indeed, but loses its peculiar charm under attendance in the cultivated garden.

It was the curse upon Adam that the Thorn and the Thistle should follow man every where, and therefore wherever man has set his foot, there is the BRAMBLE (b) with its trailing boughs, armed with stout hooked spines, and the very rib of its cinquefoil leaves beset with sharp thorns. Yet mercy has ordained that this fiercely armed foe should likewise be a friend, and the flowers of the Bramble give place to some of the most refreshing and pleasant of fruits. — Every child knows the change of feeling when the clinging bramble comes in early Autumn to be greeted with delight as a blackberry bush, and little are scratches, and torn frocks regarded when such a prize is in view as the

bunch in the picture (b), with the glossy black of the ripe berries contrasting with the bright red of the unripe, and here and there a pearly white blossom still lingering among the evergreen leaves. The seeds are enveloped in a pulpy covering, beneath which the receptacle hardens and dries up, so as to be pulled out when the fruit is eaten.

The RASPBERRY (b), is the bramble of Mount Ida, and very like the blackberry, except in being red instead of black, and in not having evergreen leaves. It is sometimes found wild, but the fruit is then very sour. There is a large and notable race all of which may be classed as the Plum tribe, of which our wild Blackthorn is the worst and least useful fruit.

In all of these the germ is below the flower, and after the blossom is over loses the calyx, and grows into a round, brightly coloured fruit, with a firm rind, a mark cleaving it half way round, containing a quantity of pulp more or less acid, and enclosing a stone consisting of a hard woody case, within which lies a kernel the real seed, white like a nut, and tasting, of Prussic acid. The wild Sloe is a hard purple thing, such as no one will eat but the village boys who will eat any thing, but cultivation has done much for the whole race, seeds have been sown in good soil, and varieties of softer texture and sweeter flavour have grown up, and though their seeds are always liable to return to the sharp wild kind, yet it has been found that by grafting, namely by cutting off the wild branches, and cunningly inserting within the bark a growing bough of the good sort, that the stock may be made to produce good fruit, of the new variety.

The CHERRY (a) is one of these plum like fruits, perhaps bearing the most beautiful blossom of all, for the white garlands are glorious under the May sunshine, and even prettier than the bright crimson fruit, which is however as fair to look on as good to eat.

"Merrily Merrily we shall live now."

"Under the cherries that hang on the bough."

well may the Hamburg children say. In the year 1432. the city of Hamburg was besieged by some of the Bohemians who had risen against the Emperor, and the citizens had been brought to great straits when a man named Wolf, proposed that all the little children from 4 to 7 years old, should be dressed in mourning and sent out to beg the enemy to have mercy on their parents. The rebels were so much touched that they promised to befriend the city, and gave the children a feast upon cherries, after which the party returned, laughing under wreaths of the crimson fruit, and shouting out their good news. In honor of this happy day, the feast of cherries is still kept at Hamburg every year, when the children go through the streets with garlands of cherries. It is said that the name of cherry is taken from Cerasus in Asia minor, whence the Roman General Lucullus brought it into Europe, and that Greek island Cerigo is so called from its cherry trees.

Plate XXX, THE PLUM (a), is the black Thorn magnified by cultivation into a beautiful purple globe, with tiny scales of wax closely covering it, and giving it the softness that we call the bloom. — The green gage is the best English sort, but none are so good as those dried in the south of France and sent over in boxes.

THE PEACH (b) is a plum with a delicate pink blossom, and a downy pink and white fruit, full of delicious pulp. — It grows wild in Persia, but was long ago brought to Europe where it grows easily, and in North America bears fruit in such profusion as to be used for fattening pigs. Neither it nor the smooth nectarine are good without much care.

THE APRICOT (a), is of a rich yellow colour, and superior in taste, though less juicy than the peach, generally much smaller too — (that in the picture is a monster). It is native to Armenia, and is grown on the slopes of the Himalayas whence it is sent all over India. Here, it is much grown about Oxford, and is eaten fresh, or preserved, as one of the most delicious of fruits. All these are trees; having the vessels of their stems composed with a hard substance called lignine, which forms wood. These are full of sap, and are like little pipes running the whole length of the stem, with rays however crossing them horizontally, to carry the nourishment from the bark to

the pith, or heart of the tree, and back again, and they grow by adding rings one without the other.

Our best and most useful fruit tree is the APPLE (Pl. XXX, fig. c.), which little girls will not like the worse for hearing that old fashioned wooden dolls, and I believe Dutch dolls still, are made out of the hard Apple wood. The Apple tribe all have very hard wood, leaves growing in clusters, from new shoots every year put forth by the branches, and fine white or delicately pink petals, loosely attached above a round swelling germ, out of which grow the five sepals of the calyx, and a great profusion of yellow stamens, and five straight styles. By and by the germ, still retaining the calyx as a sort of crown, swells into a fruit with five partitions, each containing two seeds, and the whole enclosed within solid firm flesh, covered with a rind brilliantly coloured with red, green or yellow. Left to themselves the fruits are very hard, and almost worthless, but they are greatly improved by cultivation, and as they can be grafted, the varieties are carried on from stock to stock. The wild crab tree has most beautiful delicate white flowers, pink outside, and the buds of the deepest rose colour, and the fruit is round, and so brightly coloured as to be very beautiful but so full of acid that no one could eat them — However, before the times of history the sour crab had been improved into the excellent apple, and infinite varieties had been produced, still wearing the glorious beauty of their pale blushing blossom, but enlarging the fruit, softening it, and either adding sugar to temper the acidity, or filling it with a profusion of juice. Orchards are spread every where in the Northern Temperate Zone, filled with the low old trees, with bushy heads, and bending trunks, covered with rugged bark. In early summer, the garlands of pink and white, cover them like a veil, in the Autumn, every bough is laden, sometimes so as to break with the weight, with the long bunches of brilliant red and yellow fruit. Normandy in France and our counties of Devon and Worcester are the most noted for their Orchards, the fruit is in Autumn gathered or beaten off, and the juice when crushed out is fermented into the liquor called Cider, the favorite drink in these regions.

It is the custom at old farm houses to go out at Twelfth night with a bowl of cider, and drink the health of each Apple tree, singing

"Here's to thee old Apple tree
Whence thou mayst bud and whence thou mayst blow
And whence thou mayst bear Apples enow.
Hats full, caps full
Bushels full, sacks full
And my pockets full too?"

Sometimes they throw the remains at the tree, sometimes they treat it more uncivilly by shooting at it with a charge of powder. Cider Apples are generally very acid, and so are the Apples grown in Gardens to be used in tarts, or sliced in mince pies, but many kinds have a large proportion of sugar, and are eaten raw by all boys in the country. These are generally less handsome than their sharper brethren, though the QUARENDON is quite as crimson as that in the picture, and the GOLDEN PIPPIN now nearly worn out, is a bright little yellow Apple. Some have grown in England for a very long time, we hear of pippins in Shakespeare, and NONPAREILS, were brought here in Queen Mary's time.

PLATE XXXI. THE PEAR (*b*) is very like the Apple, the flower is however quite white, and the Anthers before opening, are deep pink, but after they have discharged their pollen, turn black. The tree is of taller and straighter growth, the leaves not woolly like those of the Apple, and the fruit tapers off suddenly towards the stem. The wild pear is nearly useless, but cultivation has made it nearly as valuable as the Apple. The Counties of Hereford, Gloucester, and Worcester grow noble trees, which in May raise pyramids of white bloom, like sunny clouds against the blue sky. These furnish innumerable pears to be crushed and fermented into Perry, and scarcely a Garden but can shew numerous trees bearing pears full of white sweet juicy flesh, softer and sweeter than the Apple. The pear tree will live longer than the Apple, and is often found still flourishing when it cannot be less than 500 or 600 years old.

THE MEDLAR (*c*) is a near cousin to the beautiful May Thorn. Their blossom is still like that of the Apple in character, but

the fruit remains flat at the top, with the sepals projecting from it even after it is ripe. Medlars are never eaten till they are almost rotten, and are far less used now than formerly.

THE QUINCE (*a*) has ten pistils instead of five, and the blush coloured flower is small and insignificant. The fruit is shaped like a pear, of a rich yellow colour, and a very strong scent. — It is not fit to eat raw, but is excellent mixed with Apples in a tart, and when preserved becomes an excellent, deep red juicy sweetmeat, either whole or made into Jam.

Another large division of our best fruits, belong to a race which have woody stems, either trailing or bushy, beautiful pinnate leaves, no corolla but a small fivefold calyx, enclosing five stamens, and a single style with a round germ which becomes a bag of sweet yet sharp pulp, containing five pear shaped seeds.

The Monarch of this race is THE VINE, a noble plant, living to a great age, and thriving the more, the more it is pruned. — The stems require support, and to obtain it, they send out their beautiful spiral tendrils which curl round branch or twine upon stones, and take firm hold for the plant to mount by. The leaves are beautiful in form, and in their rich green tint, fading towards Autumn into bright red and purple, and growing in such profusion that they are a delightful shelter from the sun, and to sit under his own Vine and his own fig tree seemed to the Israelite the perfection of home rest and comfort. The little green blossoms appear in the spring, but soon fall off, and the young grape enlarges, and from deep green becomes either of a paler tint or assumes a deep rich purple, Plate XXX (*d*), while the weight draws down the cluster, and the bunch of grapes hangs down, a beautiful heavy pendant cluster, of many and many a round juicy grape, upon the small branched footstalks within.

The Vine in full bearing is indeed a glorious sight, even upon a cottage wall in England, or cooped up in a hot house, where the grand leaves and drooping clusters form so beauteous a canopy — but in the more favoured climates of the South, it is a perfect wonder of loveliness, trained along the sunny slopes of the Alps on the Italian side, or clothing the lofty Elm with its luxuriant beauty.

Vineyards are less beautiful than might have been expected for the vines are kept closely cut that they may bear better, and are either trimmed upon poles like hops, or made to grow in low bushes like gooseberries, or trained on long rods like espaliers. At the vintage, all the population men, women and children turn out to gather in the beauteous harvest, and bear it home in baskets on their backs, wreathed with vine leaves and keeping holiday. The juice is trodden out in large tubs by men with bare feet, and it is then set to ferment, by which it loses all impurities. This Wine is used all over Southern Europe as the common drink of the people, as Beer and Cider are further North; but it is only in Spain, Portugal, eastern France and on the Banks of the Rhine that it is good enough to be made an article of commerce. Spain sends out the wine that used to be called Sack, the chief of which comes from Xeres, and is therefore known by the name of Sherry, — the red wine called Port is from Oporto in Portugal. While France and Germany send out much more light and sparkling wines. Sometimes it is even made in England, and was so, much more often before it became easy to import it from other countries. The vine is not only the most beautiful but the most honoured of plants — we find it continually spoken of in the Bible, almost in every book either as a token of prosperity and fertility, or as an emblem of the holy nation itself, tended and watched, pruned and guarded, but alas! too often bringing forth wild fruits, until they so far transgressed that the once "pleasant plant" was given up to the wild boar out of the forest, and the new vine was grafted in, and called upon to bring forth fruit worthy of Him who said

"I am the true vine".

A very small vine called the vine of Corinth is grown in the Ionian Islands to supply the dried currants (corinths) which are what children like to see mottling the face of cake or pudding. It was from their likeness to these true currants that the bright red, black and white bunches of

berries (XXIX, *d*) in our gardens obtained their name of Currants. — They are much like little grapes, but the small calyx grows above instead of below the germ, and does not fall off or become obliterated as in the grape. White and red currants are most beautiful transparent fruits, but excessively acid, the black currant has a very peculiar scent in the leaves when crushed, and is particularly good and useful for puddings and preserves. Many a child will remember the fine dark currant juice that has made his mouth as black as the palate of a black spaniel.

GOOSEBERRIES (*c*) are brothers to currants, though so much larger, and the fruit covered with bristles, and the branches with spines, that make gathering Gooseberries for a pie rather dangerous work to the fingers.

Their leaves are smaller and more polished, and so hardy that they are among the first green we see in the spring. — Green gooseberries are excellent for puddings and pies and the ripe fruit is the sweetest that is often grown in English gardens.

They are both wild native plants reclaimed by cultivation, and some of the American kinds have such beautiful coloured calices, in crimson or pink, as to be often grown for ornament in gardens.

The BARBERRY (*d*), is a very curious shrub, with exceedingly tough hard yellow wood, branches covered with long sharp thorns, shining green leaves, and clusters of very pretty little yellow flowers of six petals, and six stamens. These stamens are so wonderfully constructed that at the least touch given to the filament, they leap up with a sudden pop, bend down the Anther, touch the pistil with it, and then go back to their proper place. The fruit is of a beautiful scarlet colour, and a curious oblong shape, not unwholesome but so acid that it can hardly be eaten except as a preserve. Farmers fancy that wheat will not grow near a Barberry tree, but it does not seem certain how far this is true. Another family with woody stems, evergreen leaves, low growth and small white flowers holding to the rule of four, are the fruit bearers of the Heath and Moorland Waste. Low, tough and hardy, they only want to have their roots in the bog, they open their

flowers in the short Northern summer, and ripen their berries even under the snow.

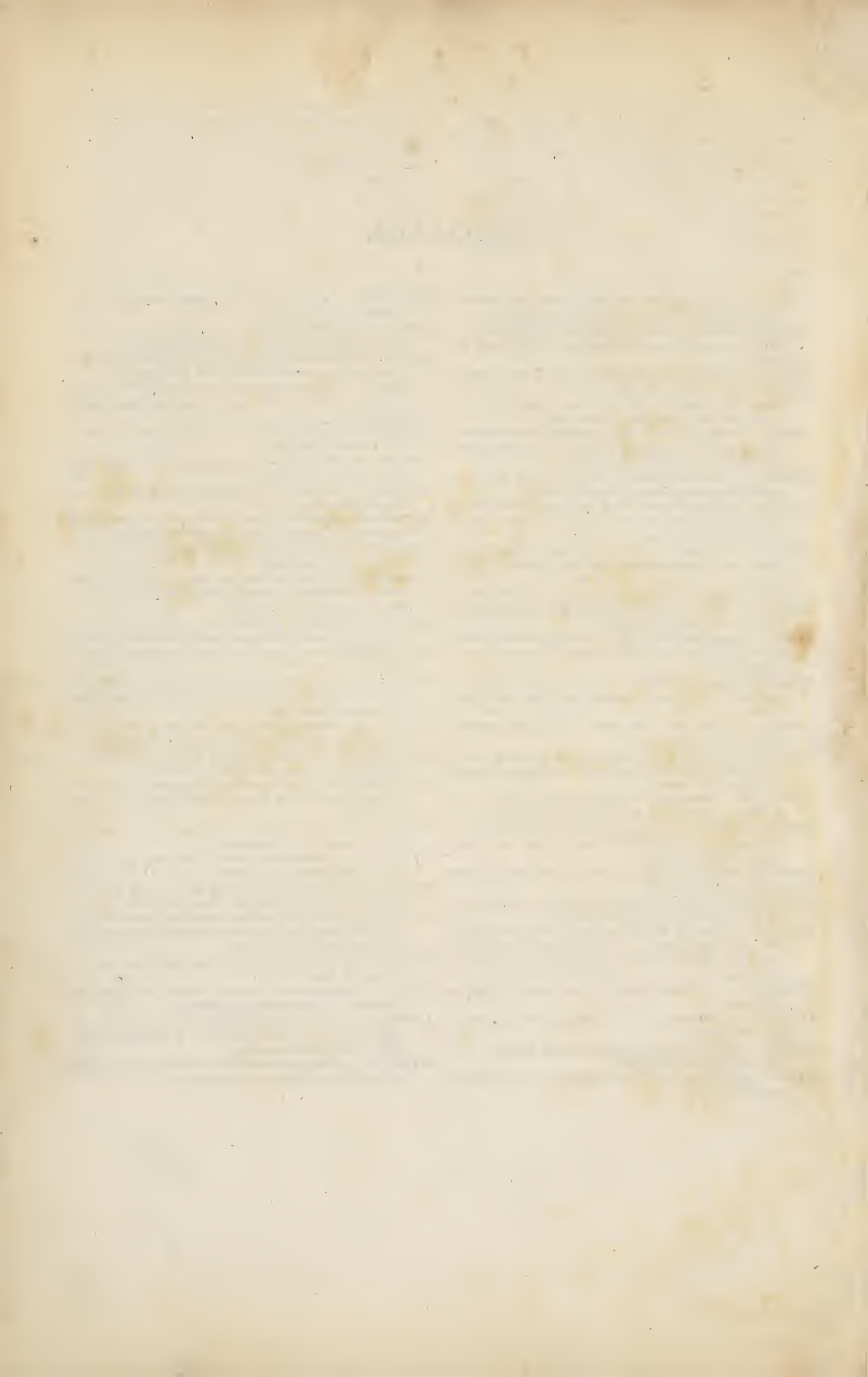
The CRANBERRY (*e*), is one of these brave berry bearing plants, the dwellers on the mountain and the marsh, and beloved by many a child of the moor and moss. It grows in Russia, Sweden and Scotland, and used to grow all over England, but the draining of bogs and marshes has very much driven it away, and Cranberry tarts are chiefly made of berries imported from America or Russia.

The WHORTLE BERRY, BEARBERRY, MOSSBERRY, and MOLTEBERRY are all of the same family, and shew how scarcely any place fit for man's habitation has been left without pleasant fruits for his pleasure and his good.

Lastly we have the MULBERRY, a large tree of rugged bark, and pale green shining leaves. The stamens grow in small separate spikes of flowers, four and four together, the styles in the midst of the clusters of fleshy calices which are in fact the young fruit, and growing together become dark red or black, and exceedingly juicy. These trees live to a great age, though there used to be an old notion that they would not bear fruit till three cats had been buried under them! They were very favorite trees in old gardens, and many of those now alive are at least 300 years old. Cardinal Pole is said to have planted the first grown in England at Lambeth Palace in 1555, and King James 1st offered packets of Mulberry seeds to whosoever would sow them. — The children of these seeds are many of them still growing, but their value was not for the fruit but for the leaves, as silkworm's food. King James hoped to have silk made in England, but time shewed that it was better and cheaper to let the silkworms and their Mulberries live in the more suitable climate of Lombardy, where large houses are filled with shelves upon shelves containing trays of the gormandizing caterpillars, which are kept constantly supplied from the trees by the Italian peasants all the summer, when they spin their golden cocoons, and thus as the pretty proverb says "With patience the Mulberry leaf becomes Satin" — Perhaps it may help the memory of some of the young learners of Geography to hear that the Morea, the Peninsula of Greece, is so called because the Venetians likened the shape to a Mulberry leaf, which they called *moro*.

GLOSSARY.

- ACRID.** — A term applied to the biting sensation produced on the tongue or skin by some poisonous plants.
- AGARICS.** — A large family of Funguses or Mushrooms, to which our eatable species and many poisonous sorts belong.
- ALGAE.** — Seaplants or weeds comprising all the vegetable productions found in the sea.
- ANTHER** — an enlarged body at the top of the stamen containing the fertilizing pollen of the plant.
- APHIS** — a family of minute green or brownish insects occurring at times in great quantities on growing plants and spoiling their growth and beauty.
- BRASSICA.** — The scientific name of the Cabbage genus and representing a large family of allied varieties.
- BRACTS** — or Floral leaves. They vary in colour shape and size from the other leaves of the plant, and are found near the flower and fruit.
- BULBOUS.** — Applied to plants with scaly layers underground in which the future leaves and flowers are contained.
- CALYX.** — The green husk or cup supporting the true flower.
- CAPSULE.** — The seed-vessel of the plant usually applied to such as are dry when ripe.
- CARPEL** — signifying "little fruit", referring to such plants as have more or less of these cemented together into a common head.
- CATKINS** — clusters of inconspicuous drooping flowers resembling Tassels peculiar to the Hazel and some other Trees.
- COROLLA.** — That part of the plant usually richly coloured and known as the flower.
- CORYMB.** — A particular arrangement of a flowering branch in which the individual flowers have a separate support and form a flat surface.
- CRUCIFORM.** — Cross-shaped applied to some flowers — such as Stocks — and other natural objects of that form.
- CRYPTOGAMOUS** — or Flowerless plants comprising all the lower orders of plants which seem to want the perfect organs of higher orders.
- EMBRYO.** — The young imperfect state of the seeds of plants or other organic bodies.
- ENDOGENS.** — Plants in which the increase to the bulk of the stem arises chiefly from the centre.
- EXOGENS.** — Plants in which increase to the bulk is effected from the circumference. — In our common Trees this is seen in the layers of woody matter added each year to the trunk.
- FILAMENT** — the thready portion of the stamen supporting the anther.
- FLORET** — a small flower or an individual one of such as grow in masses.
- FROND** — any broad leafy substance usually applied to the leaves of FERNS, PALMS &c.
- GERM** — any bud or seed in a dormant state — capable of producing a plant.
- INVOLUCRE** — a form of calyx enclosing clusters of such flowers as grow in masses.
- KELP** — the produce of burnt sea weed used at one time extensively in the manufacture of glass, soap &c.
- LEGUME** — a particular kind of seed vessel peculiar to the pea family and known familiarly as the "pod".
- LICHENS.** — A large family of Cryptogamous or flowerless plants of a scaly or leathery nature encrusting walls trees &c.
- LIGNINE** — the woody principle of which the timber of trees and shrubs is composed.
- LINEAR** — applied to leaves and other vegetable productions of extreme narrowness.
- LOBED** — a term applied to leaves with broad irregular rounded divisions.
- MEDULLARY RAYS.** — Lines of woody matter stretching from the central pith to the circumference of timber trees.
- NARCOTIC** — the powerfully stupifying principle found in various poisonous plants.
- PAPILIONACEOUS** — or Butterfly shaped, applied to the flowers of the Pea and Orchis tribes from the resemblance some of them have to insects.
- PINNATE** — applied to compound leaves where the divisions are opposite to each other and placed on a common stalk.
- PARENCHYMA** — the tissue of plants composed of minute cells.
- PETAL.** — The coloured portion of the plant of which the flower or corolla consists. It is of one or more petals the flower is composed.
- PISTIL** — the thready portion of the flower surrounded by the Anthers, and communicating with the seed vessel.
- PROLIFEROUS** — applied to plants which — in addition to other means — are propagated by plants.
- PHOENOGAMOUS** — or Flowering Plants, those in which the different parts of the flower are distinctly visible to the naked eye.
- SEPALS** — the separate divisions of the calyx or flower cup, as the petals are of the corolla.
- SILIQUE** — a species of seed vessel or pod such as is found in the Turnip family, and others.
- SPATHE.** — A sort of calyx encircling and covering the flowering portion of the plant like a hood or mantle.
- STAMENS** — the thready objects inside the flower surrounding the young seed vessel and consisting of the Anther and Filament described above.
- STIGMA** — the summit of the Pistil and usually more or less rounded in form.
- STYLE.** — The intermediate portion between the Stigma and Seedvessel — it is frequently absent.
- UMBELLATE.** — Plants with their flowers in a compound cup shaped head — the umbelliferae — a large natural family afford good illustrations.
- WHORL** — the arrangement of flowers or leaves in a circular or wheel like manner all round the stem.







- a Lichen.
b Fungus.
c Alga.
d Moss.
e Fern.
f Grass.
g Palm.

- a (*Lecanora tartarea*).
b (*Agaricus variabilis*).
c (*Delissaria sanguinea*).
d (*Hypnum revolvens*).
e (*Polypodium vulgare*).
f (*Scelus lanatus*).
g (*Lamia pumila*).



- h. Orchis.
i. Rose.
k. Auricula.
l. Clematis.
m. Oak.

- h. (*Orchis morio*).
i. (*Rosa canina*).
k. (*Primula auricula*).
l. (*Clematis vitalba*).
m. (*Quercus robur*).



STUDY OF THE FLOWERS

1897



a Daffodil.
b Poet's Narcissus.
c Snowdrop.
d Violet.

a (*Narcissus pseudo-Narcissus.*)
b (*Narcissus poeticus.*)
c (*Galanthus nivalis.*)
d (*Viola canina.*)



e Primrose.
f Cowslip.
g Wood Anemone.
h Spring Crocus.

e (*Primula veris.*)
f (*Primula vulgaris.*)
g (*Anemone nemorosa.*)
h (*Crocus.*)





a. Rose.
b. Lily.
c. Carnation.

a. (*Rosa centifolia*.)
b. (*Lilium candidum*.)
c. (*Dianthus caryophyllus*.)



d. Larger Convolvulus.
e. Pansy.
f. Honeysuckle.

d. (*Ipomoea purpurea*.)
e. (*Viola tricolor*.)
f. (*Lonicera Caprifolium*.)

PLATE 1



PLATE 2





a. Dahlia.
b. Hollyhock.
c. Marygold, French.

a. (*Georgina variabilis*.)
b. (*Althea rosea*.)
c. (*Tagetes patula*.)



d. Sunflower.
e. Aster.

d. (*Helianthus annuus*.)
e. (*Aster chinensis*.)





a Christmas Rose.

b Laurustinus.

a (*Helleborus niger*.)

b (*Viburnum tinus*.)



c Hellebore.

d Winter Aconite.

c (*Helleborus foetidus*.)

d (*Eranthis hyemalis*.)





a Cabbage.
b Turnip.
c Brocoli.

a. *Brassica oleracea*.
b. *Brassica rapa*.
c. *Brassica botrytis*.



d Radish.
e Carrot.
f Red Beet.

d. *Raphanus sativus*.
e. *Daucus carota*.
f. *Beta vulgaris*.





c Celery.
d Onion.

c (*Aspium graveolens*).
d (*Allium cepa*.)



a Asparagus.
b Potato.

a (*Asparagus officinalis*).
b (*Solanum tuberosum*.)





a Artichoke.
b¹ b² Rhubarb.

a (*Cynara Scolymus.*)
b¹ b² (*Rheum raponticum.*)



c Pea.
d Scarlet Runner.
e Bean.

c (*Pisum sativum.*)
d (*Phaseolus multiflorus.*)
e (*Vicia faba.*)





a. Hop.

a. (*Humulus lupulus.*)



b. Teasel.

c. Poppy.

d. Chicory.

b. (*Dipsacus fullonum.*)
c. (*Papaver somniferum.*)
d. (*Cichorium intybus.*)





a. Hemp.

a (*Cannabis sativa*.)



b. Mustard.
c. Lavender.
d. Canary.



b (*Sinapis nigra*.)
c (*Lavendula spica*.)
d (*Thalaris canariensis*.)



Musa sapientum



Musa sapientum

Musa sapientum



a. Flax
b. Cotton.

a. (*Linum usitatissimum.*)
b. (*Gossypium herbaceum.*)



c. Coriander.
d. Burdock.

c. (*Coriandrum sativum.*)
d. (*Scirpus lacustris.*)







a. Lucerne.
b. Tareor Vetch.
c. White Clover.

a. (*Medicago sativa*.)
b. (*Vicia sativa*.)
c. (*Trifolium repens*.)



d. Yellow Clover
e. Red Clover
f. Saintfoin.

d. (*Medicago lupulina*.)
e. (*Trifolium pratense*.)
f. (*Onobrychis sativa*.)





a. Rape.
b. Ryegrass.

a. (*Brassica napus*)
b. (*Lolium perenne*)



c. Red-beet

c. (*Beta cicla*)





a Barley.
b Bere.
c Rye.

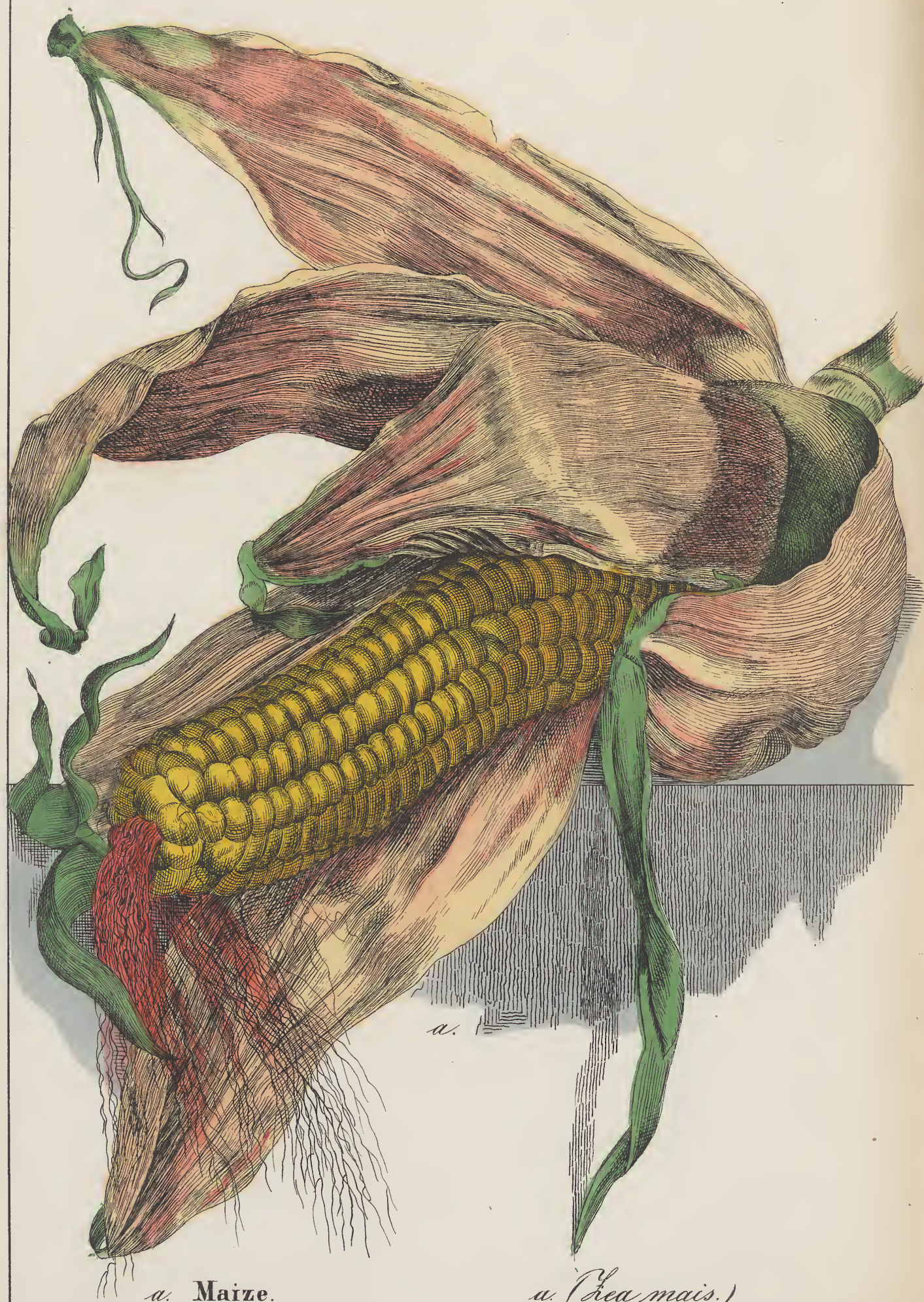
a (*Hordeum distichum*.)
b (*Hordeum vulgare*.)
c (*Lecale cereale*.)



d Wheat.
e Bearded d.
f Oats.

d (*Triticum sativum*.)
e (*Triticum sativum*.)
f (*Avena sativa*.)





a. Maize.

a. (*Zea mais.*)



b. Rice.

c. Millet.

b. (*Oryza sativa.*)

c. (*Panicum & Setaria.*)





a Foxglove.

a (*Digitalis purpurea.*)



b Buttercup.

b (*Ranunculus bulbosus.*)









Lords & Ladies, or Cuckoo pint.

(*Arum maculatum*.)



Herb Paris.

(*Paris quadrifolia*.)





Yew.

(Taxus baccata.)



Henbane.

(Hyoscyamus niger.)





Thorn apple .

(*Datura stramonium*.)



Deadly Nightshade .

(*Atropa Belladonna*.)





Monk's-Hood.

(*Aconitum napellus*.)



Woody Nightshade.

(*Solanum dulcamara*.)





Celandine.

(*Chelidonium majus.*)



Fool's Parsley.

(*Aethusa cynapium.*)





Hemlock.

(Conium maculatum.)



Garden Nightshade.

(Solanum nigrum.)





Water Hemlock.

(*Cicuta virosa*.)



Spurge Laurel.

(*Daphne laureola*.)





a. Herb Mercury

a. (*Mercurialis perennis*.)



b. Yellow Vetchling
c. Laburnum seed

b. (*Lathyrus aphaca*.)
c. (*Cytisus laburnum*.)



2020.10.17



2020.10.17



a White Bryony.
b Black Bryony.
c Waterdropwort.

a (*Brionia dioica.*)
b (*Tamus communis.*)
c (*Oenanthe fistulosa.*)



a Fine leaved Waterdropwort.
e Caper spurge.

d (*Phellandrium aquaticum.*)
e (*Euphorbia lathyris.*)

12. 27. 1904



12. 27. 1904





a Common Mushroom.
b Common Chantarelle.
c Common Morell.

a (*Agaricus campestris*).
b (*Cantharellus cibarius*).
c (*Morchella esculenta*).



d Many cleft Earth-Star.
e Carmine Peziza.
f Fly Agaric.
g Flat horned Sphaeria.

d (*Geaster limbatum*).
e (*Peziza coccinea*).
f (*Agaricus muscarius*).
g (*Sphaeria Hypoxylon*).





Cucumber.

(*Cucumis sativus*.)



Melon.

(*Cucumis melo*.)





a. Strawberry.
b. Raspberry.
c. Gooseberry.
d. Currants (red & black).
e. Mulberry.
a. (*Fragaria vesca*.)
b. (*Rubus idaeus*.)
c. (*Ribes grosularia*.)
d. (*Ribes rubrum* & *nigrum*.)
e. (*Morus nigra*.)



a. Cherry.
b. Bramble.
c. Cranberry.
d. Barberry.
a. (*Cerasus avium*.)
b. (*Rubus fruticosus*.)
c. (*Vaccinium corymbosum*.)
d. (*Berberis vulgaris*.)





a. Plum.
b. Peach.

a. (*Prunus domestica.*)
b. (*Persica vulgaris.*)



c. Apple.
d. Apricot.

c. (*Pyrus malus.*)
d. (*Prunus Ameriaca.*)





a. Quince.
b. Pear

a. (*Cydonia vulgaris*.)
b. (*Pyrus communis*.)



c. Medlar.
d. Grape.

c. (*Hespilus germanica*.)
d. (*Vitis vinifera*.)



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